Curriculum assessment assessment

Name : tshingombe tshitadi fiston

Curriculum section 1:

1.1_

Thesis. Degree honor, council quality rules low become justice development court and labor relations conciliation mediation, Engineering electrical trade research policy skill ,safety security order develop ,defense order

1 .1.1 *Thesis:
*** Research policy**
trade theory minimum : legislation skill development :

honorable member certificate transcript outcome award

*overview : journal

* Key :
* Background:

*__1.1.2Education technology,: Education engineering relate low manufacture ..__

__Degree honorable ; college low labor justice__ ,

* Low relate literature traditional African LTA practical low rules African Convert unite international relate low rules European American curent in unity language culture African rules

Low EIC, rules cebec rules ,UNESCO rules culture American culture NPA ,, accountability cultural science mathematics,Conte law USA ,UK Australia ,national rules RSA sabs sans rules .

*College and university low Engineering rules :

Registration of low rules low congre low rules master cpd continue developing skill master degree ,diploma continue topics rules ,unity translate in African traditional mathematics usuel and Scotland UK land UK and African land low rules integration reintegration accountability research recharge system education technologie education technical career and vocational career trade training trainer facilitator moderator low assessor lowrules in unity Bantu language cultural old land Zimbabwe Shani RSA isizulu ,Bantu semi Bantu protobantum. Swahili integral language ,Luna Lynda tshoko ,lingala Kongo ,Zander ,, integration chines Indian language development integration technologies translate cultural low college rules ..

Management system information system : language arabe number word ,Romain number ,hierogrif Egypt antic heubreu biblical accountability building Egypt pyramid research archeological herbetologic genie research years , Ethiopia antic accountability ,Indian +,, language system accountability integration system sun geography :

Systeme adaptative ,,chiness art dojo master skill system training.

Continue system information in African conversed language ,unity conversion synchronise low rules developm sectors advancer in rurale sector ..

Engineering master skill and master engineering electrical and degree honour engineering./ Educator master skill master degree. Language. Low security ,police army system.

- *overview:

Accountability time zone African language geography histoire land African

mathematics design personality one day , phylosophie education Africa in culture village ,moon sun irregularity regulation in Africa one renting one sun one thing evaluate translate ligth years unity ,,hors power kWh , UK Europe system language,,system ,,language understanding comprehensive extending interpretation things ,, movement current in energy in Africa ,

***1. 1 .3Overview:Labour low rules machinery OSHA LRA GN rules African act sabs low Engineering electrical low rules , council bargaining power low rules trade manufacture compliance .**

*Key low : mediation facilitator low rules accountability African bureau trade language code practice rules engineering . Education technology and university developm department minister goverment culture ..unity
Low justice land low theory : trade
Accountability
-*key city power Eskom commissioner low eleccompt nova blr low , unity city regulation governing , industrial trade low system , language African system information relate system Zimbabwe ,saqa framework qualifications low rules a t unity qualification to country Congolese design framework unity qualification design organisation originator EU ,USA Australian UK ,Uganda Nigeria. Africa cultural workshop cultural language Africans isizulu ,,shangani. ,,Luba Swahili lingala. Interpretation , animation cultural
* Orientationtheory bibliography, investigation African earth moon Sens phylosophie African tolling working movement ,, interpretation pratical biblic heubreu Egypt manuscript herbetologi archeological lithography earth material design

to
me

***1.3.2..3 Overview career libraries ,mentor facilitator library research method book .**
Low congre library,

***1.3.2..3.**
3.1Key: about library research centre the mission of the low library of congress is to provide authoritative legal research , reference and

instructions service and access to an resolved.
Established 1832 low library has a collection of over ,2,9 million volumes spanning all systems and period of low and government all the .
* The library of congress provides congress admnister the national copyright system and manage the largest collection of book recording , photography maps ,16 years authority record .
* Administration commercial ,low environment criminals low procedure intelligence , property legal , .
* Broken down research court record .
* Grant proposal : non profit grant proposal date submission grant submitted to asresss

_____
1.3.2..3.4.request for proposal :
4.1* education technology ,and master engineering electrical a, Education Technical career Engineering .
*REP. |. Proposal | compagny
- 4.2 .project overview :

- 4.3 .project goals :

-4.4.scope of work :

-4.5 .current roadblocks and bariere.

- 4.6.evaluation metric and .
-4.7. submission requirements.
- project due |. Date. | Budget amount

-Contact : email.

_____

1.3.2..3..1.*Overview: national skill fund ,,and national research fund. Career proposal
-1.2*dealine : local Engineering study in workplace jhb RSA. Pretoria Midrand. To

UK and USA ,10 December 2024.
-1.3* time frame : 5 years ,,to 2 years
- 1.4*limitations : principal career proposal career compte.
-1.5* submission by : Aiu research and. ,dhet saqa.
-1.6* instruction : pdf proposal and award policy (PAPPGG),NSF..,,proposal certificate congre archive internet library
Award compagny. Aware ,,saqa aware ,dhet aware ,college aware.
-1.7.* minimum budget : 40000.0000 total program officer budge except.

Google budge apple
- 1.8* eligibility:
* Requirements : as of application ,hold degree field engineer trainee, provide award type .
- preparatoration :
1.10.Review faculty early development:. allocation note:.

_____
- |documents| require|requirements|NSf
-cover projet | yes | begin withcareer|N/a
-project summary| y|following | N/a
-project descript| y |. | N/a
-result from | yes |.
-budget and|
- facilitator.|
-senior person|
- bibliography.|
Card board
- supplemtaire.
- past doctoral.
- research.

_____
1.3.2..3.1.11. project description : .

1.11.1 proposal sect research :
1.11.2. rational :
1.11.3. preliminary :
1.11.4 .data appropriate :
1.11.5.literaire where appropriate :
1.11.6. hypothesis overall :
1.11.7. questions research :
1.11.8 .description propose education activity integration:
1.11.9. description team and experience and expertise argument lock.
1.11.10. research / Education relevant for your career trajectory goal..
1.11.11 . limitations : conting plans .
1.11.12 . Expected outcome .
1.11.13. Definition of project of scussful .
1.11.14 distribution / delivery time research .

1.11.14. measure planned or possibility resulted ...

Project research.
* Data investigation
information system
* Data nature occurance : time
Data action take

1***.412.Report :* Research experience base on Job career.advanced essential filling basis Poste senior junior cadet minim.grade a,b,c,d ,e. Pratical job diploma certificate credit time diploma license issue. Gift cards close bid certifcat***
vs *.
*and researche thesis academic university College topics degree honour ,degree master buchell and diploma continue supplement and certificate graduation .level 1,to 12. Pratical school

_* total career experience and outcome -career thesis design award guidance faculty documents project research

*1***.412.***5. Overview experiemental theoretical pratical in requirements trade theory engineering subject certificate experiemental certificate issue in compagny customer Eaton career assessment academic and university College , experience profile in answering questions duty project customer scheneider training certificate experiemental e for ,50% , 40% engineering Alison cpd experiemental answer experiemental career city power cover letter formal Portofilio link answer assessment Microsoft NN diploma in grade minimum junior pass training project experiemental aware increase project case support Microsoft traiblazer algorithm IP license book book experiemental.
1***.412.***5.1 * key compliance week trainer practice customer record instruction bulletin Eaton installation week long answer buy trade in plant customer sale Eaton Scheineder modicon Relais instruction customer buy Microsoft customer money answer trade filling appreciate job is last week customer sale Eaton make modicon didn't come in RSA customer microstf dynamic it secret career didn't show is the the place permitted can enter those components the accept you to make a project with and watch zone 52 scope volant , Microsoft model 1000/ badge key gate office didn't see wath doing retirement license trade traiblazet,200 the make in different

countries draw country .
-school money make is budget academic voting amount ebook order copyright order salary pay sleeping salary base shift teacher lecture learner year pay bonus lessons from 100 rand per day shifting,2500 rand salary wage bonus annual ×12 month over time extra class teacher in assessor moderator granted seta sasseta CETA grade ,1 to twelve 6 teachers,6×2500 , primary 6 teacher high School teacher and lecture rand house home air Teater ,100 rand ,30,300 ×9000+900/ water = 18000 rand class per month grade ,10× 800 rand ,800 × 6 = = 400000× 13= 4800000 rand pay treturned tax , ammandement.
- bank account yhave 2000.00 rand account t ,2000000 estimate budget and money granted ynow compliance 500 rand rand by tdesj chair desk panel t buyer ,pay Ccma labour eaward bank school teacher gone to e labour court ,bank school teacher gone ,to Ccma away seta casebook ,money school pay is not for boss is school pay money school make arrested irregularity court the figth with teacher learner court .
-* school fee policy arrested report tpat search exhibition years buying course subject no record books till point policy.
- pay granted settlement arrange damage interest court pay complain ecase order pay review payment transcript payment irregularity payment judge made order award money assesment casebook order judgement pay the pay granted skill development levy bargaining.
Uif labour pay settlement policy sector intelligence assessment order debator creditor minister gov pay docket Portofilio minister pay sector rural sector irregularity development rural pay non register pay irregularite course nated aware Education sector dismissed does meet pay sector skill development legislation notice rural chaine supply bid scope annuel delivery team.
- development pay aware compensation labour infrastructure development building docket public minister sector building rebuild case development sector dhet non existence NN diploma regulation irregularity existent record.
- 1***.412..***develotrural skill world UNESCO find UNICEF Ong non tfund programme a compat,educator teach tableaux dimensions industrial refused that refused that teacher development rural the teacher if accepted product successful.
- Education development child workers domestic house home no certificate sum children project , make tools ring irregularity police take project, aware certificate,
- compliance 1000 computer ,1000 badge ,1000 mol .

- electricity Snel Congo RSA Sens city power and Eskom language master doctoral.
* Praticien sans successful rescue theoretical form issue course licensed theory reform tand depat synchronise Education meeting annuel results is no going next year's design engineer generator AI form teach information no

going no make formal generative files student end generative teach note path, deployment in sust generative entrepreneur ethe files principal in the open day school the don't file why is open files refused this site form principal generative inttelt,hod file ..
* Inventory auditing work efficiently ,billan work revenue anuej reject matter stick take report anuek delivery security police do wath leave those concentrator memorial revenue memorial revenue billant material industrial cuvrie lesson plan store room snej file reject rejected accept ,1000% concentrator matiere billan after over view book time table library ,copper reactor chemical ,50% book copper ,30% plumb zinc book ,class journal account book memory rejected book review paragraph billan work revenue book total ,1000% revenue come evry month dig benefits ,60 books , copper impurities induim copper process alloy

to
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*1***.412.***6.overview :electrotech matter ,:
- notion fundamental and electrical circuit electrical unity ,force ,torque power energy ,transformer , efficiency ,charge speed ,
   1***.412.***6.1 thermodynamics, heater temperature,conversion exchange rater convect radiation emitting, natural of electricity.
- circuit ,AC ,dc ,him insulation,low power .
Efficiency n= user energy ÷energie give,,
Input energy/output energies system
 := W2/W1,,,
Energies
-balance power ,, efficiency ,
P2= omega ,w/F= F.d/Y,,, P2.= n.T/9,5
-C=1/2×π×xc=.
-ng=ns-n sleep. ,, synchronies speed ,asynchrony ,, rate ,100% ,

- comparative motor energy squirrel and motor synchro coil
Loss rotor ,loss input loss output ,loss joule ,loss stator .. stability system load frequency. Started developm torque energy lifting

_ 6.2comparative.
S= E×I×√3,,
P= s× for
Loss= loss heat - loss rotor .
A= √ s.s-p.p

- manage generator system : converter frequence , E = S.E0= ,/ ,, S =k× T×R/E

1*.412..*6.4.Comparative load system breaker ,motor ,generator : characteristics,load torque

Transmission energy ,NS input system break ,loss stator loss ion loss rotor break x axes speed increase break system torque function ,input motor speed decrease in synchronisation speed ,power entry from break to motor ,loss motor loss ion joule ,mechanical power exit in generator decreases a generator speed on torque resistor ,torque nonmu an ,elelectromotricr ,ex,Rx,,block ,,Ns(1-sx),,

6.5: cyclo convertiseur : phase , A,B,C ,,
Δf=1/f=120°/360°

Comparay pipe line ,1,6 mm diameter ,110 kV ,,NS(1-g) 5 kV,50= 3300ka,, 425,,59

- converter rectified,to convertor insulator thyristor ,,
Ed@,EP voltage ,I'd = Ed+Ed2/R

- overview :notion theory electrotechnology
emf .E= B.L.v. Faraday low ,,
Laplace electromagnetic ,EMF = B.I.L
Force electromotive= force mecanique,
Speed U= E ,,> motor ,U= E+R1, generator
Power conduct = Power electromechanical= force electromecanics ×voltage supply
= B×L××I×E/B×K=E.I

Key :S1 type of service door .continue temporaire intermittent.
IP: indices protection ,protection material ,wheith ,1,25kg
- number plate , : model ,letter ,high =90mm, power:1,8kw,factor of (0,82) voltage ,220v delta ,380 start ,
- nominay speed ,1419 tr/m,, 1500 , asynchronous,f= 50hz ,,3ph ,,t° max (40° C) ,,SI = 100%,class insulation,, #50° to 180° , mass 24 kg ,,NFC

Torque ,,NM,,torque resistance ,,speed ,,,power

Comparative : report ,Kr= 60,,NR=O,85 motor speed speed rotation = 1450 Min ,,NR=0,85
Diameter ,axe =20mm
Work until wit = give lift treuik ((g=9,8#,,motor work

J pump ,until ,kg ,,
Power electrical = Qg.h/ 100,,w = f×L,,F= m× g
Wit = m× g× h,,w sec ,,,Put = w.u÷ t ,,,
Power mechanical= torque mechanic × omega

.

* 6overview : trade theory. Compliance
- instantaneous power no symmetrical.
- P(t)= UR.IR+IS.IS+UT.IT
-UR=U×.√2.×sin .omega .time.
-US=U×√2×sin[wt-2π/3|
-UT= U×√ 2×| sin wt-4π/3|
- PR= 2×U×Isib.w.t sin (wt+beta
- PS= 2×U× sin (wt+120°). Sin (wt+beta+120°)
- PT= 2×.U×.I ×sin(wt+120) sin (wt+ B + 120)

UN valve. R ms
IL1+IL2.×cos(2π/3)(jL2(2/3π)+IL3cos(alph/3.π)+(jIL3sin(4/3π).
IL1-IL2 ×1/2-IL3×1/2+j×√3/2(IL2-L2
.√IL1^2+IL3^2+IL3^2-IL1.IL2-IL1.IL2-IL2=I2.
Load non lineare ..

   Sin (x+Teta)=cos (Teta) .sin(x)+(sin (Teta)(cos..teta)
-    sin (x - Teta) = cos (Teta) sin (x) -sin(Teta) cos Teta .
(7a)+(7b) = 2cos (Teta) sin Teta .
-Vab= va- VB
Vab - VCA = Va - VB (VC - Va) = 2 Va - VB -
Va = sin (x) (VC) ,(x- 2/3)
VC = 2 sin (x+ 2/3pi ..)

- diagram vectors. Clock wize ,indices

 you're ..
Energy
W= integral x1 to xo / fdx
V= v (t) = dx / dt ..
Integral .x to x0 ..ma (t) dx..

_____
E= P= P.t = V.×I.×t.
E= v.×i×t= i^2×R×t= v^2×t/R..
P= w/ j

-_____
Basic kWh ,,kWh ÷ hour = kWh
Calculating demande .
kWh / pulse ÷ 3600 second ÷ # sec betem

- (I1+I2+O3)× VPN × 5,77
_____

- constant power transfer .resistive load ,
P= V×I= V^2/R.
- PL= V×L1^2..
Non dimensions..
-P= sin ^ 2 Teta + sin ^2(Teta - 2π/3)+sin ^ 2(0-alph3.π)= 3/2.
PTO= 3.VP/2.R.
- Z= | Z| .e ..exp resitivf ...
- IP= VP/|Z|
-IL1= Ip. sin (Teta - alpha)
-IL2=IP.sin(tets-2/3×π- alpha)
-IL3= Ip× sin (Teta - 4/3- alph)
- PL1= VL1×.IL1= vp×ip× sin(Teta)sin(Teta - alph)
- PL2= vL2×IL2= vp×ip× sin (tets-2/3 × π).sin(Teta - 2/3π - alph)
PL3= VL3×IL3= Vp× Ip× sin(teta-4π/3)

_____
PL1=Vp×Ip/2×[cos(alph)-(cos(2teta- alph)]
PL2= vp× IP/2×[cos(alph)-cos(2teta- alph/3 ×π-alph)]
PL3=vp×ip/2[cos(alph)-(2teta-8π/3-alph)
-Otos=VP×IP/2{3cosalph [2alph - alph) + cos (2 Teta - 4/3π-alph
- P tot = 3× Vp× IP/2 × cos .alph .
- P tot = ,(3 V P / 2|z|).×cos

_____
IL1= VL1- N/R,, IL2= VL2-N÷R,, I L 3 = Val 3 - N/r.
- IN= IL1+IL2+IL3..
- 1= / iN.R/VP
I= sin (Teta) + sin (Teta - 2 pi / 3) + sin (Teta + 2 π/3 = 0 .
= Sin (Teta) +2 sin (Teta) cos (2 π /3).× sin (Teta) - sin (tera)

_____
* Overview: Theory : lineare non liners system fundamental an process fabric. On basic trade signal ,,input and output

Transformation conservation system
Synchronous and asynchronous emittor transduction.

- la place transforme. Functionalite
Period speed time propagation signal frequency

L(&)(S)= integral.(inf)to (0). f(t)× e ^ 1§t× dt.

- Dirac function distribution.

- la place functionalite differential

- dx/dt = 1.4 t-0,5x
S.x(s)+0,5(x)=1.4×1/5
X(x)=1/S.S(S+0,5)

-VL=L×di/dt..
V(t)=L.(di/St)
-L.d^2/d^2+R.di/DT+1/0
-R+L.dt/St=t,1=0, t= 0
- circuit R.L.c..

- R.L.C.
- L.d2/D2+R.di/St+1/c=
linear.

- L.d.^1/dt^2+R.di/
St+1/c=
Dx/St=1,5 t-0,5x
P(t)=0,5
Q(t)=2,4 t
V(t)=e. exp . (Integral .P(t).
(dt)
= e.integr , 0,5 St
= e^0,5 t
----
di/St+1/RC=0.
di=I.dt / RC ..
- integral .dt / I = 1/RC.
Integral .St

- log I/ I0=
_____''''_____

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- * overview for
compulator

1***.4.1.2.5..***Overview: research methodology base experience and pratical.
Experiemental orientation guide workbase Manuel construction guidelines:
- electrical engineering
Electrician
Design. ,,
Z×A×U= .
ΔU.2L××Pxz×Z×A

..**schema electrical / drawing design
 panel
_____&
- electrical power effect dynamic between 2 conduct ,3 conductor parallel , consumer power AC ,DC
Courent I1,I 2..
S= porter in cm ,a = distance in cm ,,
P= U× I.[W].IP.U
P=U×I×cos .flux ..IP × U× cos alph .
P= 3×I×I×cos [W] IP×3×U×cos flux
F2, 0,2×I@×2×s,a
=.....(N)
F3=0,808×F2[N]
F3=0,865×F2[N]
F3=0,865×F2[N]
-resistancd of conductor,L= ligth of conductor ,m aluminy,
- Z = conductivity, m /mm ion ,
A = across area conductor ,mm Sq..
- resistance = of coiling of induction condensator , L = inductance ,H ,f = frequency ,Hz ,,C = capacity ,f v= angle phase ,xl= reactance inductive ,O,

- series parallel installation ,
U=I×R[V].I.U..R=, R.I..ohmm × 33 m ,ohm m× 8,3 mm Sq × ohm
XL= 2×π×f×L, XC ,,2× π×f×c
{
=
ZR2(XL-XC)2=+ZR,,cos = --- ohm

RG, R1R2/R1+R2=..
R1R2×R×./ ..
Z..Z.@..Z2..=, X..X..

1***.4.1.2.5***1***..***Cable and conductor : value short circuit current ,,assignment current ,,
Transformation
- system design of cable conductor:
Cable PVC,0,75 mm , souple,H05V - K ,0,75 black ,,big cable coutchouc ,3 conductor = 2,5 mm ,,
- protection , green yellow , symbol h ,supply voltage ,300/ 300v,03,,$00/500,450/750v
Material insulation cable : caoutchouc naturej styrene ,butadiene silicon material,PVC ,styrene tressfibre
- construction specialist cable : meplat with conductor separe H,NHL ,,cable plastic gain ,cable concentric onduke
- characteristics of materials : polythylene ,elastic ,thermoplastic ,color ,grid degree Up ,stabilt chemit,alcol verni

Fuse motor tree phase value rotor squire ,(DIN VDE 0636,,
Control thermic ,,start delta over load max start ,2 × assignt current , max 5 sec ,, regulation 0,58,,
Switch ,switch gear ,,, close open circuit
Usage current ,
I = courent etablid ,IC = courent coupe,I e = courant assigned d employ ,u tension avant fermeture ,u r = tension established ,AC load command DC Serie AC , IEC/EN 60847-3(VDE 0660 partie switch for motor starting b,,power cut open close ,L/Rv,ms. Break current .

Letter and Laball switch USA ..
S ,switcy combination lock non lokkin, disconnect switch ,drum switch ,flow operated switch ,foot operated switch , knife switch ,limited switch ,Liquide levek actuated switch ,locking switch,master switch, mushroom head,pressure or vacut,operated switch,pushbuy or vacut, pushbuy swity,pushilluminates ,rotary switch stepping switch single throw

switch ,speed switch ,temperat actuated , time delay switch ,toggle switch transfer switch ,wobble stick , fuel contactor ,relay blowotbreak coil field ,commutating field compensating ,generator ,motor separately excited ,series field ,shunt field , diode
Connector,,
- Consol visual ,prodibus , can bopen ethernet commuyaty ,net pin 1, pin Atex , installation

Command automatics

Installatt port ethernet ,port ethernet prise RJ45,led ,port com
Synopsis cabling system
Logigrame algorithm ,commutator.

_____
1***4.1.2.6.***Overview : research in training and .university and college ,cpd learning
campagnie work base : experiemental.
Module ,construction distribution system design

- describe between fault current peak ,value ,RMS symmetrical value .RMS , asymmetric value ,X/R ratio ,
I= symmetrical RMS current ,IP = peak current,e= 2,71,wv,= 2.p.f ..
Cycle (ANSI/IEEE.C37.13.2.2015..
-Design a distribution system.
-Developm of a system one - line ..imp, --_Standard drawing , additional d rawing --schedule and specification
- power systems voltage ,
Voltage classified
- income service Volta,income consider
- type of system:
Power system analyse ,short current wave.
- fault current calculat, fault calculai for specifications,medium voltage ,breaker fault ,molded circuit breaker , interruption derating ,trNsfot loads data ,voltage drop ,
Grounding ground fault ,
- typicK power systt generator and generator system ,generator short circuit ,caractt,generator set size ,rating ,generator installation site 'capacitor and power factor , motor power factor correction ,
- typical applicatt ,health facilities ,quickly generator and load bank ,power quality,
- power quality seism ,ampacities for conductor ,NPA 70-2014,

- safety goal power hazard oashs , NEC
- regulation requ
& Maximum flexibility ,minimum
- maximizing electrical minimy operating : loss conductor transfory .
: discussed further ,
- development phase : input plumbing construction v.
- construcy documents : project ..

- bid .
- project award contractor db panejct.
Transformer information and symbols: draw out ,power circuit breaker ,mounting breaker low voltage drawing .
- single primary feeder loop systeme, primary radial
- duplex fused : switch intelicy..- fused selector switch one .
- soaring transformer substay reijsce ..
System preliminary,factt .
- typical protective relay scheme for small generator , differential reisu .
..
- typical emergency power systems b: ..energy
- maintenance test,
Breakers calculat on a symmetrical current rating : fault calculation : on note interrupted capabilities ,I1,and ,I2,at operating voltage must not exceed maximi symmetrical .
- 13,8 kV ,,breakers x/R= 15, 375 MVA,transfo 13,8 kV primary ,3750kva , secondary ,4,16 ,,,50vpc ,w
On system,13,8 kV system ,3,75 MVA base ,
Z=3.75MVA/375,,= 0,01 Pu or 1%
Z^2=X^2+RR^2=R^2(x^2/R^2+1)
R=Z/√x^2/R^2+1=1/√266=1/15.03=0,066%
X=X/R(R)=15(0,0066)=99%
Transformer standard standard ,5,5% impedance has ,+ 75 manufacture toleri,
Transformer standard ,5,5% impedance ..
From transformer loss per unit percent ,R is calcul .
31,000 watts full load
-6,800 watt no load load

_____
24,209 watt load losses
R= 24,2kw/3750 KVA = 0,0065 Pu or ,0,65%
- transform x = √ z^ 2-R^2.√(5.09)^2-(0,65)^2=√25.9 ^2-0,42=√25,48=5,05%

_____

	X.	R.	X/ R
13,8 kV system	0,98%.	0,066%.	15
Transfo.	5,05%.	0,65%.	8

Systt total. 0,04%. 0,76%. 8
.tree

For three phase ,i3 phase = E/x ,,
X ohm ..
I3 phase = IB/X,, IB is base ,,
- base current IB = 3,75MVA/√3(4,16Kv)=0,52k.A
I3 phase = I1/ x = 0,52 /0,0604=8,6k, sym ,,syst ,x/ R= 9 is less 15
Duty circuit ,is 8,6 ka three phase I and moment ..
8,6× 1,6 = 13,7 KA. I 3
- for line - to grounv fault ,
ILG = 3E/2x1+X0=4IB/2x1+xo ,xo is seauet reactance transformer positive ..
ILG= 3(0,52)/2+0,0604)+(0,0505=9,@KA sym ..
The ,50 vcp ,, applied,z= x ,in= x = 0,52/0,55=9,5ka stm ,
X/ R ration ,15 or less multiot ,10 for short circuit bdury ,short circuit duty is then 8,5 kA ,sym ,(I1,I2) and momentary is 9,5 × 1,6 ka = 15,ka (i3)...

_____
Design distributor system
drawing note / build..

_____
1***4.1.2.5.***Fault calculation check break application or generator bus for the system generator shoe each generator ,7.5 MVA ,,4,16 kV ,,1049 full load ,I b = 1,04:,sub transient reactance ,x"d= 11% ,,or x = 0,x= pu ,
Gen ,x/R ratio ,30.

1/X's= 1/x+1/x+1/x== 3and 1/Rs= 1/R+;1/R+1/R=3/R..
X's= x/3and Rs ,= Rs=R/3,, system ,X's/Rs = x/R= gen .x/R=39,, generator neutral grounding reactor are used to limited the ilg ,to i3 phase ,IB phase = ib / x + I/x+1b/x+31b/x= 3(1,04)/0,1@=28,4 ka ,symetru,E/x
Amper ,system ,x/R of I multiple b..short circuit duty is 28,4 (29,5 symetricaj ..
-Three phase symmetrical interri capacity

_____
Breaker type|vmax| max ki| at 4,16 op vo

1*.4.1.2.7.*Overview: trade theory base experiemental.
-basic electricity ,: continuing education professional development course ,
- technical learning college..
Training ,basic electricity course energy and system electricity , system fundamental math. ..
- electricity
-1. introduction: ,energy foundation ,joules ,
How to generated ,electrical transmission.
-2. simple forms of electricity : static electricity , magnetic and electricity , electromagnetic,electric charge :
-3.electrical princiy introduction : electric power distribution ,electronic introduction,electrical principle ,circuit ,battery power principle.
4.hydraulic analogy principle : hydraulic component equivalent hydraulic equation
Limited to hydraulic analogy .
- electrical low and theory :tangent ,gal ometer , understanding ,Faraday low ,maxset Faraday ,electrical generator operation understag ..
- classical mechanics , potential difference ,power resistance and current ,power ..
- circuit : coils and capacitor : parralke ,parallel ,resistance ,
- power phases : understanding single ,understand three phase ,phase converted ,AC power generay ,sine :
- transformser : transfo efficiency trisgke delta ,polyphase ,3 phase edisub system connecting load single three phase ,source ,,
Electrical motor : motor lubrication, electrical motor introduction ,brushes, AC motor breakers ,motor problem diagnosis chart ,motor principle ,motor principle synchry motor ,torque ,stepper rotary ..

_____
Energy introduction : electricity principle charge act ,,
- an electric field a complex simple type electromagnetic field by and electric ,.
- the electrician ,generator devi

- type of transfo,air core for use ,above ,1mhz ,iron core use 100 khz - 1mhz,,iron core for use at audio main frequently ,centre tapped secondary,,two or more secondary,auto transformer ,,set down ,,step up ,, ..primarie in series's for ,239 volt , kub primary in parallel,main isolating transformer ,building site transfo phase.
Wye introduction:

I1= v1/|Ztotal|<(- Teta)
I2=v2/|Ztotal <(-120-teta)
I3=V3/|ztoak|<(129°-0)
Z totaj total = zln + zy ,,z toaj ,,
I1+I2+I3=In=0
Delta = V12= V1-V2=(vln<0°)-(VLN<-120°)
=√3VLN<30°=π3v1<(phase v1+30°)
V23= v2-v3=(vln<-120°)-(vln<120°)
= √3VLN<-90°=√3v2<(phase v2+39°)
V3.1= v3-v@=(vln<120°)-(vln <0°)
= √ 3vln <150°=√3v3<(phasev3+30°)
.I12=V12/|ZΔ|<(30°-teta)
.I23=v23/|zΔ|<(-90°-teta)
I31=V31/|ZΔ|<(150°-teta)..
Relate ,si I31.
Kck ,node..
I1=I12-I31=I12-I12<120°
=√3.I 12 <(phase ,2 - 30°)= √3I13(-teta)
- I 2 = √ 3.I 23 < (phase i23-39°)=√3.I.23<(-129°-teta)
I3= √3.I 3 < (phase i31-30°)=√3.I31<(120°-teta) ..

_____
Connecting transfo
-vo= vt× np, ,,/ VT ,VT ,,vs = VT × NS.
N..
Vs/ vl = Ts/To =
Vs= vp× secondary turns/primary turns..

_____
-maxwell Faraday equation: z vector ,x vector ,y vector ,, n ,sum ,,integral differential sum..
- Maxwell Faraday equation ,-v×E= -derive partial .B/ derive partial times.
- v- the curl operator ,E(r,t) is electrical field ,and B (r,t) magnt field generally ,r and time ,t
- Maxwell Faraday ,four equation fundamental theory classic electromagnetic ,integral for ,Kelvin Stokes theoren .
Integral countiurn .E× DL= - integration .sum to ..derive partial B./derive partial time × dA..
Sum is a surface bounded by the closed contour ,sum derive partial ,,
- E is electric field ,B is the magnett field ,
- dk is an infinitesimal vector element of the cotyr ,derive partial ,sum .
- dA is an infinesimal vector element of surface ,sum if it's direction is othogky to the surface patch magnitude is the area of an infinitesimal patch of surfay.
* Hydraulic equation example.
- hydraulic.
Type | hydraulic| electric | thermal | mec

Qty | v/m cubs | q(c). |. Heat Q,j|p,s
Pot| P[Pay=j/m| V=j/c| k=j| v ,m/ s
Flus| m^3/s | A= C/s| A.j/s | force ,F.
Flux | v/ m | C/ m.s = A/ m | Q" ,W/ m
Lin. | π.r.Δp/8.n.l| j=- - .| Q" = k.vt..
Linea model ,poseilk low ,ohm ,,

_____
Understanding voltage introduction:
Δ vba= vb-va= - integral (b) to (do) E vect× DL .vect -(- integral .A to do ,E.dl ..
= Integrally .B to ri ..E .DL + integral.a to ri .
Vec E.dl = integral .A to B .E .vect .DL vect

1*.4.1.2.8.*Overview: industrial electrician : and trade essential. Trade advance ..
- essential skills inventory assessor skill inventory,technical reading ,oral computer user writing ..oral commut , computer skill ..
Trade essenty is a research project funded under pan Canadian innovation innovative ,humain resource and skills development partenersgio with apprenticeship section depart innovation and advanced learning trade programme increase trade pathway client build on present ,skikj rpk intervention project learner to create path a number Education tools ,tools process
Trade specify essential skill currit specialized resource skill ,automotive cabinet electrician coij industry.... occupation vtopicd license ..
Industrial essential questions
- how many 60w bulb can put on circuit essential,,
- wath will happen if one of the components in series circuit fail ,,
- in wath order does the current flow throf..
- from .wath is methods for wiring smoke essential,,a smoke alarm shall be supplied from ligthning circuit that supplies receptacle and any case shakk ,there is no disconymeans between the smoke alarm device the wiring methods smoke include interconetunite accordance rules ,32-109,,
- wath percent of electrician are employed in manufacturing and Education in industrial.
,as electrician how does your averat salary compare to other occur.
-measure learning instructor roles number of information measure is not based in fail or pass learner improved skill review individual assessment,regular basis potent early ,pay attention ,design and completed skill mastery of skill at highlesr leveh using the application trade would demonstraetgat learner trade requirements,

- intervention time framework: the trade essetiel interview developm for indivylearner , LPR vrelearn skill v,,
Trade essential : lesson plan title date instructor session topics ,learner outcom objectivity competency statement skill ,plumber
Teaching points organisation .
Time content delivery methods ,prepare a schedules of learning activt to gain interest ,using carpentry estimated work ,energized acticiy break activtie describe activy .
- resource and material requirements : list material assignment ,
- accommodation : description.
- reflection note
- sample pie charts ,block occupation ,wiring ligthning system ,
block power distribution generation system v, communt,process control electrical ,electrical equipment, communication system ,process system :uildyv environment bcontril system..

- maintains hand tools ,modified portable power tools ,maintain stationery power tools , maintained mechay measure equipment ,use compulator system ,
Installs faster ER fitting and connectors ,
Performance locks out and taggif procedure ,installer wiring cabling and termination , installation communication and intercommunication wiring cabling terminal ,installer raceways Associa vcomponent ,maintenance seisv restraint system v.instalker high voltage power systems,inspect high voltage power , troubleshooting high voltage power system ,repaired high voltage system ,servit high voltage system , install low voltage system ,repaired low voltage system troubleshooting low voltage supply,service low voltage bsysteh ,, maintence installation VDC power .install ground bonding system ,install protection device inspect ,install rotation equipment contruj,installed driver and associated v,install non rotating equipment association b,installa environment control system ,inspect environment controle vsysteh ...install ligthning system ,install AC system

- 0verview : introduction to tpm : companies understanding value of training in maintenance techniques , Education and training investment people,,operant in additional technique operator sharpen convention, technical edut and training for operational and maintenance must taillored to individuals requirements,mizushim plant of Nihon zeob ,, maintenance form daily inspection and simple operate using equipment operator learners abnormal condition in the produtplant operational learner first hand hotto deal with unusual or crisis situt the simulytraininf was conduy at different

levels .
- maintenance personnel are like docty,they must be competent atherwise their patients conditions can worseb, maintenance examination when the qualifications individual were certify as equipment maintenance personnel as finishings and machining , maintence working can be certified in their own field ,in addition minister labour had qualicafition systeme for electrical maintenance electrique..
- level and objet of training simulation training for operator
- advanced management supervisor: basic design modification technique ,taught by instructor form the training center:
- testing skills : experience workers : learning applied technic ,for circulation high pressure gasses in the pilot plant and testing safe , abnormal and economic operational.
- mastering skills top ,and middle ranked workers : learners basic skill by diagnosing and treating abnormal equipment outbreaks on simulation equipment.
- learning basic , low ranked and new workers ,learning basic equipment operations by using simmulion equipment, ..
- maintenance schedule inadequate in compagny reevaluate and improved part , maximize the effectiveness of it activtie maintenance, inspect device drawing . Compagny organisation schedule regular weekdays operational,distinctive maintenance meeting line manager staff planing product , speedy implementation of month and weekly , < Fuji film Yoshida mnami plant systeme system used for overall schedy as well for semi quaru and monthly equipment v..
- conduct training to improve operation and maintenance skill : impriviy and maintenance skills four tpm activities and the tenth step of tpm ...
- productive maintenance system : policy maintenance management equipment and systems enance execuy
main: equipment facilitator : electrical section equipment dep engineering maintenance shop , indiviy section in plant operations
-step policy compagny make anuak goaj maintenance schedule improve and turn ,and maintenance and around ,, maintenance autonomy maintenance.
- step do , Education and assistance corrective maintenance construction management period ,,
- step maintence prevent repair period check service patrol priority ,daily maintenance autonomous investigation condition breakdown check result discovery unexpected operational record
Maintenance statistics data report , maintenance record , evaluation check , evaluation , maintenance design and data , evaluation , improve and education,,line and staff,,
-cleani g and lubricating ,cleaning ,,example ,
Cleaning standard clean ,,plant manager section chief pm engineering foreman ..
- cleaning ,cleaning methods , cleaning tools , cleaning time , cleaning cyct day ak ,Mo

No rubber scrap adhere removed stelll ,15 minute ,no scattering sweet away with ,, oil ruberr ,wipe clean cotton , tighten the automat supply ring hoping , tight supply valve and check for leaks , lubrication standD , lubrication methods ,lubriy equipment , time ,like levek must between upper and lower limit ,pour by hand 10 mibb
Oiled half way up teeth ,gearwhel half way ..
* Procedures for develop inspection Education and tray : step
-step Prepare established categt prepare teach matery maintence staff
-Step schedule train leader prepare circle training b,, general inspection checklt sheet and manual ,cuteway model slides chart
-Step train Prepare member train ,
General inspection conduct general inspt all equipment ,circle meeting weakness list proposal of countermy ,weakness list deterioration part inaccessible area,
- execution countermeasures again , established tentative daily inspection standard , inspection skill checkup ,self diagnosis, self diagnosis and application for audit , workplace supervisor ..
- equipment specific category..
Equipment - specific categories: inspection educay , inspection training and pratice ,self inspect ,one month
- leader Education ,4 session,2h ,2h, 2h, ,2h ,week,1,2,3,4
Operator training : >1+ hours ,>1+ hour>1,5 + hours ,> 1,5
Leader eduy ,by function structure structure names of parts ,problt and counter measure, focuya d inspey method standard, inspector pratical ,operator Education by grout ,function ,
Inspection training and evaluation ojt meeting ,self inspect ojt meeting ,
- topics : air pressure ,air pressure basic operation electric drive system ..

to
me

- top manay plant tour ,upper midky manager inspect your ,review and discuss ,,
-Step :requested ,audit schedy prepared ,
Workplace audit , audit meeting ,
Report on smakj group activities workplace ,audit of small group activity ,audit sheet on small group .

* Analyse on
- factory : dry battery process ,
-Phenomenon: batteries failing on revolving table ,
- description: loss of balanced accomplished shift of center of gravity caused

by external .
- basic conditions : conditions creating friction contact between product warrping of bottom abnormal
- contact.
- relevance of equipment material jgs ,omitted ,table surface conditions irregularite revolvit ,guide shape position ..*
- circulum for the basic equipment maintenance technical traing course :
1.Requires | subject | elements
3 days | nut,bolt | basic connect nut bolt
3 days | key match | type and appro key
| Filling machine key
| Technique with key
3 days | shaft an bearing| fitting shaft
| Bosee ., attaching
| Shaft case lubric
3.day | transport equ| gear driver unit basic,chain unit ,belt and brake system ,,
3 .day . Sealing method| importance
And basic techniques ,types of gaskets, assembly o ring and taper pipe thread ..
*_ develop early : equipment manager program . When last tpm develt activit is eari equipment management when new equipment is installed problt often show up during test running commisst.
* Autonomous maintenance audit cycle .
-.step audit result summarised report distributed , audit results displayed: by headquarters: step Tom evaluation result and plan countermeatv, report promotion committee,tpm smakj evalt result plan countermeast evaluation reflection b,compiling overall evaluation and policies autonomous maintenance activities..
Step develop autonomouse maintenance circle prevent deterioration work..
General inspection to prevent deterioration control basic conditions cleaning,attem restore equipment to good operating conditions,initial ...
* Organisation and tidiness : means to ident aspect of the workplace band step appropriate standard ,job ..
* Plan :/ Engineering) maint/ product
Plan /annual equipment inspection schedy , production schedule crisis . Monthly maintenance schedy , weekly maintenance dob,daily maintenance wort weekend holiday long term ,maintenance record ,confiy of result .

*
- maintenance activities base on edps
New equipment maintenance data : equipment ledger reavalui, breadot counter measure safety improt , monthly inspect result unfinished activities ,analyse of maintenance for activities v,
, equipment component inspection ,breakdt , maintey inspection files ,non period maintenance chart ,mid term schedule ,list a,b maintenance ,terminal

,invoice , scheduled ordering procedure execut , maintenance result.
Full implementation : automouse maintenance v,become indepet

-1*.4.1.2.8.* overview: instituts technology
mathematics for computer science and computer science and ,AI laboratory..,
- engineering of electrical engineering and computer science .
- terms of the creative comon .
- key : proofs,
Introduction: , reference
1*.4.1.2.8.*1.What is a proof :
- proposition , prediction,the axion ,the axiomatic method ,our axioms ,
Proving and implications ,proving and only if ,
Proof by contradiction ,good proof in practice .,
1***.4.1.2.8.***2.well ordering proff ,templates for WIP proof ,factoring into prime, well order sets ,
3.logical formulas , proposition from proposition,
Proposition logic in computer , program, equivalent and validity, algebraic of position ,the sat problem, mathematics data types , reference data types ,4.set
4.2 sequence , function, binary relation , binary relation ,finite ,,
5. Introduction ,: ordination ,strong introduction,strong introduction,strong induction vs induction vs well ordering ,,
6. State machines : state and transition,the invariant principle,pratical correctness termination,
, the stable marriage problem.
7. Recursive data type , recursive definition and Struct industrial, strings of matched bracket,recursive functions,non negative integer , arithmetic expression,games as recursive data type,
, induction in computer science.
8. Infinite sets: infinite cardinality , the halting problem ,the logic of set does all this really work,, Struct..
9. Number theory , divisibility,the greatest common division ,, prime mysteries ,the fundamental theorem of arithmetic,Alan turning ,modular arithmetic,turning code , multiplication,EULA ,, RSA public key,wath has sat

got with it directed

- directed graph ,partial order ,vertex degrees ,walks and paths, adjacent matrices,walk relation ,directed acyclic graph schedule,partial order , representative partial order set containing,linear order , equivalent relation, summary relation, communication network,routine,routing measure , network designs ,vertex adjacent and degrees , sexual demographic,some common graph,,
- isomorphism,bipartite graph matching,colouring ,walks in simple graphs , connectivity, special walks , k connected graph planar graphs , drawing in plane ,definition of planar graphs ,Euler ,bounding ,number edges returning , coloring classifying polyedra , another characteristics planar ,coloring planar graphs ,classifupokyhedrs ,another characteristics for planar graphs..
- counting .: introduction
- sum and asymptomatic,the of annuity ,sums of powers ,approxtsum ,Hangin outover the edge , product ,doubles ,asymptotic notation, cardinality rules ,counting, thing by counting another counting sequence ,the generalized product rules ,the division rules ,counting subset , sequence with repetition, pigeonhole principle.
- inclusion ,exclusion , combination proofs , generating functy ,infinite series ,counting with generating function ,partial fraction ,solving linear recurrence ,formal series ...
- probability: introduction, events and probability spaces ,let's make deal,the fours step method,strange dice ,the birthday principle,set theory and probability, conditions probability ,month hall confusion , definitely and notation ,the fours step metht conditions ,why tree diagram work ,the low probabit,, Simpson ,mutuaj independence, probability versus confidential.
- random variables : random variables , independence , distribution functy ,great expectations,linear expectations deviations theorem ,rstim by random sampling ,
- , recurrence formal: the to owner merge ,lineare ,,.:
2: explain how use mathematics model method to analizing problem computer proofs play central ,used certify software hardware, argument
- deduction existan r from the factory the factor is pretty things about decart renev,actual science false demonstrate ,fail to predict ,, proposition axiom

*__1.4.1.2.9. key : wath is a proof:__
__Definition, a proposition is a statement communication that is either true or false ,,, the first is true second ..__
Proposition,1.1.1.2+3=5
Proposition 1.1.2.1+1=4,,
- statement such as Romeo give circumstances it five o'clock , or stock market will rise to morrow..
- unfortunately it is not always decide if a claimed proposition is true or false ..
-:claim no non-negative ,integer n the value of n 2 ,c n ,c141 ,
- a prime is integer greater than ,# that is not divisible ,, ..
-; numerical experiments check ,, ,,checking D 39 and confirm ,0 39 ,/ D 1601 is prime which isn't not so claim false ....
-;wath is proof for compulator science scientist some of the most important important things to prove are the correctness of programs and systeme wether a program ,system does its supposed to programs are notoriously buggy and there's growing community of research ,case CPU child ,now routines used leading manufacturer to proved correctness avoid some notoriouse past mistakes developm mathematics methods to verify programs system remains an active research area ..
- predicate : a predicate can be understood as proposition whose truth depends on the value ,of one one more variable , so ,n is a perfect square ,decrib ,can say it's true or value until you know wath the value variable knhappened..
- proposition ,4 is a perfect square Rembert ,4 is perfect ,square nothing's say that has proposition is true ,if value were ,5 you would get false proposition ,5 is a perfect square, prepositions predica,
The axion method the standard methods procedure for establishing truth in mathematics was invented Euclid ,,
1.4 our axiom : pair of points proposity simple additional proposition ,by proofs is sequence of logical deduction from axiom and previously proved statement that conclude , questions ,you probably wrote , important true proposition are called theorem, a lemma is preliminary proposition use for proving later proposition ,A corrilary is proposition that follow in just few logical step ,logic deduction ,logical deduction or inference rules to prove new proposition using
-

- previously proved ones ,a fundamental inference rules is modus poneus rules ,
Tigger proof that O implies ,A is a proof of ,A inference rules are sometimes written ,,
Rules P implies A,A implies R,P implies ,R one the other hand non rule ,not

rule,not ,implies not ,Q P implies , is not sound ,if P is assigned ,T and A is assigned ,F the antecedents true and the consequences is not ,
-1.5.Proving an implication pattern of proof in principle a proof can sequence of logical deduction form axiom previously proved statement from axiom conclu with questions..
- Proving an implication proposi to ion of the form" ifP,then Q"are called implications this implications is often rephrased as " P IMPLIES Q" here are ,
Quadratic formula) if ax^2,c BC,CD ,,0 and a ,0 then ,XD ,, b^2-4ac= 2a
Goldblach conjecture ,if n is an even integer greater than ,2 n is sum of two primes ,
If. 0 ,x ,2 the X^3, 4x,C1>0 there couple of standard proving an implication ,,
Wath is proof the inequality certain..
Proof contrapositive and then state ,
- proced as in method , theorem ,is irrational then P ,r is also ,A number is rational,m= n for integer ,m and n if ,So , proof we prove the contrapot if ,P is rational , squareing both ,,
-"statement," IFFQ" is equivalent to the two statements," P IMPLIES. Q" and
" IMPLIES P" ..
1.write ," we prove P prove P implies A" do this by one the method
-write ," first we show ,P implies A"
3 write now again ..
- method , construct a chain of Iffs ,in order to prove that is true off Q is true ,prove is equivalent to a third statement and so forth until you reach ,A this method something requirements more ingenieure, is definitely..
- the standard deviations of sequence of value x1;X2;::::;xn is defined to be X1_/2c. X2_2/2c__c..
Theorem standay deviations of sequence of value ,x1 ,xn is zero ,off all the value are equal to ..
- proof by case : square of real number are always no negative ,so evry term on the left hand ,side of equation this means ..
- evry ...-
- proof by cases breaking a complicated proof into cases and proving each case separately is a common useful proof ,let agree either a club mer or not if evry pair of people in group has met we ll call the group has not met we call it group stranger ,
- proof the proof is by Cass analysis let ,x denote one of the six least ,3 have met x .
2 among the 5 people at least ,3 have not met we have to sure that a least one of two case must hold ,,
-the implies that the theorem hold ,case 1
Case 2 suppose that a least 3 people's did not meet x
This case also splits into subcase
Case 2,@ evry pair among those people mer each other ,then these people

are a club of at least 3 people si the theorem hold this subcase
Case ,2.2 : some pair among those people have not met each other then that pair together with x form group of at least ,3 stranger si the theorem hold in this subcase this implies that theorem alsi hold in case 2 and therefore hold in all case ,
- proof by contradiction in a proof by contrast on indirect proof you show that if a proposity were false ,alway approach ,,name suggests indirect proof cal a little convoluted ,si
Method in order to prove a proposition by contradiction .
1.write " we use proof by contradiction"
2.write" suppose O is false .
3.deduce something know to be false a logical contradiction .
4. Write " this a contradiction therefore..
- good proof in practice ,
We ' ll prove by contradictttthat p ..2 is irrational remember that number is rational if it equal to ratio of integer for example ,
3:5. , D7=2 and. 0:111 ___ D are irrational number ,,.
- creating a good proof is a lot like creating best work of artfact ,it takes practice experience to write proof that merit such praises ..
-computef systet ,when algorithm and protocols only mostly with ,due to reliance and hand waving argument the result can range from problematic to catastrophic therac machine provided therapist
- involved a single faulty commands computer ...- class problem
- precisely identify explain mistake in this bogus proof,prove correctly ,evry positive real number has square root positive other negaty , property , identify exactt where the bugs are each of the following bogus proofs ,8 ,a bogus. Claim ,1= 8> 1=4 bogus proof 3> 2
3log 10.1=2/>2log.@=2/ log 10.1= 2/3> log 10.1=2/2,=1=2/3>1=2/2
Claim rules ..
- prove true statement is true because a b is real number and square of real number negative prove claim

- problem ,why suprise paradox of problem ,1.1 present a phylosophie problt ,but not mathematics one homework ..
Show log 7 .n either an integer or irrational number

- is irrational unfoy that proof was non constructive it didn't reveal specific pair a; b with property , 3 by
- definition : finished proof that value for work by shows that 2 log 2. Base 3 is irrational,
- wellotdsei g principle : evry nonempty set of nonegative integer has smallest elements state...

- well ordering proofs we actut have already taken the well ordert principle for granted in proving that ,p2 is irrational that proof assumed that for any positive integer mand n the fraction ,m = n write lowest term that is form ,m= 0=n=0 m0 = no are posii integery,, .
- proof task

1***.4.1.2.10.*****Overview: power precision driving , determine power output of coreless motor ,current and efficiency plot and theoretical cold calculation estimate motor performance.**
- calculating initial power requirements: DC motor are transducer because they convert electrical power ,P.in into mechanical power ,pour , efficiency loss P loss in joules ,iron loss in coreless DC motor ,,
- physic power ,power define rate doing with, P= F.. (d/ t) since speed is distance over time the equation becomes ,= P= F.s in the case calculation for power the product of torque angular distance per unit time or simply the product of torque ..- where ,
P= power in w
M= torque ,in MN
F= force in N
d= distance in .m
t= distance in ,m
w rad = angular velocity in rad / s,
- power mechanical ,n multiply 2π/60 ,, m torque ,,m ..NM ,,n = speed in ,m = torque in MN
- coupling measure from break motor current load break ,resistor motor ,
no= No- load speed
Io= No - load current
MH= stall torque
R= terminY resistance ..
- step 2 : plot current vs torque and speed vs torque ,,
Torque graphic horizontal axe vertical axe ,zero torque zero curevt slop ,k I constant ,A/ m ,torque constant torque m.N/m
- ki= current constant ,,km = torque constant ,
Purpose discussion , in practice the motor friction torque
Mr ,determined ,constant km of the motor and the measure no load current Io .the , vs speed line and the oraue vs current line are stared not at left axis ,offset equal horizontal ,
MR= fricty torque,
- step 3: plot power vs torque and efficiency vs torque , in most cases two additional vertical axe added for plotting efficiency as functy of torque a

second vertical , construction table motor mechanical power at variouse no load to stall torque ,,speed speed voltage applied motor , maximum efficiency occurs at 10% of the motor stall torque
- blue = speed vs torque (n vs M)
- red = current vs torque ,I vs M .
- green = efficit vs torque , n vs M .
Brown = power vs torque ,Ovs M
- brush DC motor govern circuit derived characteristics of , applied DC ,,
U,= power supply in v
I= current in A
R= terminal resistance in ohm
Ue= back - EMF ..
W = angular velocity of the motor ,
Key = back ,EMF constant of the motor .
- manufacture ,in V/rpm or MV/ rpm potential increase .
Mm = torque develop at motor
Km=motor torque constant
MR= motor frictt torque .
ML = load torque v..voltage applied to motor terminal motor velocity directly proportional to torque ,slop of the torque speed curve motor performance slope is small number Corless motor ,
Δn = change in speed
ΔM= change in torque
MH= stall torque
no = no load speed,,

- theoretical calculay DC motor is to operate ,24 applied to of motor terminal and torque load 68 mNm find the resulting motor constant motor ,speed speed ,motor current motor efficiy power output from motor data sheet it can be seen that no load of the motor at 24 V is 7800 Min of load couple motor shaft run ,, general idea of performance by motor constant km in this case we are constant of 28,48 mNm/ SAR.w
Y= value of axis variable to determine ,
M = sloop if line change in y dived by change in x
X = value of x axis variable given
b = y intercepted point at which the line cross the axhx ,y = torque to be determined ,
m = change in torque .
x =
b = stall torque ,value where ..
The line equation

- Kirchoff voltage EMF ,eoV×R+IV
Power supply volts = current ,
Constsb

_____
I= r.sin .flux. ...
R = rayon ,,
F.tan= F.sin flux ...
Frad= F .cos
2. Torque : t= F×r×sin ,flux. Or :
Torq = F.tan × r
T= F.r ....radius ...torque... Force ...
T= F× r× sin flux
1 revolution = 360°
1 revolution = 2* P radian
1.radian = 189/P
W angular velocity ,w tangential , v tan = r.s
2 power : Prot = t.w
- t motor = ts - WTS/an
- wmotir = (ts-t)w/ts
Linear modej DC motor speed curve is good torque speed between actual curves green maxib motor ,linear..
Torque for Maxon .
- Motor (w)= -(ts/en)w.w+tsw
-Pmotor (t)=-(an/ts)t.t+en.t
- deg ,c =(deg ,f-36)×5/8
- deg .F=(deg c × 9/5)+32
R= 1,8k+0,6° ,k= 5/8(R-0,6°)
° F= 1.8°c+ 32°,,
°C = 5/9(°f-32°),,°R=°F+460°
K=°C+273°,, °C= Celsius degree,°f= Fahrenheit degree,k Kelvin ,° r= Rankine degree ,,
- high inertu loads =
t= WK^2× rpm÷308×T.av
T=W.K^2× rpm÷308×t..
W.K^2× rpm × 308 × t .
Inertia reflected motor = load inertia (load rpm ÷ motor rpm) #

- Na = 120× f ÷P,,   ,,f = O× Na ÷ 120...
P= 120× f ÷ Na
Torque horsepower ,torque ,and speed,
HP= T÷ n / 5259,,,
T= 5250 ho /n ....
n = 5259 ho / R
Motor slip % slip = ns- n÷ns × 100
I= current in amperes
E= voltage in volts
kW = power in kilowatt
KVA =apparent power in kilowatt
Ho = output power in horsepower .

n = motor speed in revolt per minute ,Ron
N s = synchronous speed in revolution per minute ,Ron
P= number of poles ,.f = frequency in cycle per second .
T= torque in pound feet ,
EFF = efficiency as decimt
Of = power factor

Equivalent inertia: in mechanical systems rotating operate speed same equivalent inertia
Total : wk ^2 eq = wk2 part (Npart/ N prime mover) .2

Prime mover > gear reducer > load
.note reducer= load rpm
Wk^ eq= wk^2pm+wk^2red(red .rpm/Pm rpm)2+wk^load(load rpm/ On .rpm) 2 induce ..
The wk^2 equivalent equation to wk^ 2 of the prime mover ,plus wj^# of the load ,this eauat to wk of prime mover plus wk the reducer unite time ,1/3 plus the wk 2 of the load time (1/3) ^ 2..
- WK^#.eq= WK^2 part (N part / B prime mover) .2 induce ..
.wk^ eq = 100lb.ft^ 2+900lb.ft^2(1/3) Indi,2 + 27,00 lb.ft ^ 2(1/3).2 induce
WK ^ 2 eq= lb .ft ^ 2 .pm + 100 lb .ft red+ 3,00lb .ft
Wk^ eq= 3209 lb ft

- to find. | AC single phase
Amper ,horse | Hp× 745÷ E× eff× pf
Tree phase
Hp÷ 746 ÷1,73×E÷eff×pf

- amp/ kilowatt: ,kw× 1009/ E×pf ,| kw× 1099/1,73× E×pf

- to ,KVA : KVA × 1000/E. ; | 1,73× E× I/100.kva = I× E/ 1000|. 1,73× I× Eп÷ 1000
- horsepower= output | I×E×eff×pd÷746| , 1,73× I× E× EFF × pf÷ 745

- locked rotor current ,IL from name plate data .

Three phase: IL = 577× ho × KVA / HP ÷ E
Single phase iL = 1000× ho × KVA / hp

..motor name plate indicate ,10 ho ,3 phase , 460 volt ,code f
IL = 577× 10×(5,6 or 6,29)÷ 460

IL= 70,25 or , 78,9

- effect ,line on locked rotor ,ILine = IL @ en × × Eline ÷ En/O..
- motor has locked rotor current in rush of 100 amperes ,IL at rated nameplate voltage ,EN/F of ,230 volt wath is IL with ,245 volts , Sline applied to this motor ,
IL @ 244v = 100×254v/230 v ..
IL @ 245= 207 amperes..
.horse is work done unite time equal ,33,00 ft work permit when is done by source ,t to produce M rotation about axis the work is .
Radius ÷ 2π× rpm× lb
HP = radius × #π× rpm × lb ÷ 33,00 = TN÷5,#59
HP = w×s / 33,09× S..
W= total weight in lb raised.
S° hoisting in feed per minute
E= overat mechanical efficiency of hoist purpose
- HP = volume (CFM) × head (inch of water ÷ 6356 ÷ mechat efficitof fab
Ho = vilun (cfn) pressure (lb .per sq.ft(÷3300× mechanics efficiancd of fab

- Gpm× total dynamic head in feet × specific gravity ÷ 3969× mechanical efficiey of pumon
Total dynamic head = static head + friction heading

Total time acceleration,
wr^2)308[rpm1/T1+rpm2/t2+rpm3/T3+....+rpm9/T9]
,t=
18,26/307[159/46+150/48+300/47+300/43,8+200/39,8+200/36,4+309/32,8+100/29,6+40/11]
= 2,75 sec

* **1*.4.1.2.11..*overview: specifications of electric motors**
- table contest: 1,
***1*.4.1.2.11.1*Key**
- fundamental concepts electrics motor
Basic concepts:
- torque ,mechanic energy ,power ,

-apparent ,active and reactive ,power factt , efficiency.
- torque versus power ratio
- single - phase AC systems:
Parallel and series start connection ,three phase AC system ,.

- delta connection .
Three phase inducty motor.
- working principle induction motor
- working principle rotating field .
,- synchronously speed ,NS ,slip
- rated speed .
- insulation matert and insulation system , insuktmaterish .,insulation system ,thermal class.
- insulating material weg ,insulat system ,
- power supply characteristics :
Power supply ,three - phase system , single systeme
Characteristics of of the electric motor power supply .
,,rated voltage ,multiple rates voltage ,rated frequency, connecty to diffence frequency ,
Voltage and frequency : variation tolerance ,three variation tolerance , three phase motor starting current ,limitat,D.O.K starting ..
- starting delta switch compasaring switch ,
- series parallel electronics , acceleration characters torque ,speed ,design minimum standardized torque,value
- characters of wEG motor ,load inertia ,acceleray time : duty ,cycle ,locked rotor ,standardized maximum value ,
- dahalender .
Motor with two ,more speed motor independent winding ,.
- rotor resistance variatt: start voltage , variation,frequt ,stator voltage , variation , frequency ,frequet inverters , breje motor , brake operation, connection diagram,
Brake coil ,power supply ,brake torque ,air gap adjustment,
Operating characteristics ,winding ,heating up , ,electrical motor application thermal protection ,resistance temperature ,sector (pt-100) ,thermistor , and NTC ,bimetal thermal
protector ,thermostats ,phenolic .
- protection system :
- service duty .
- standard service duties
- duty types design
Rated output ,.- specify of ,,Ltitude ,ambiant temperat,
- determine useful motor output at different temot and altitude conditions.
- agreessuvd environment.
Enciry containing dust and divers ,explosive ,atmosphere ,degree of protectt ,identifiicodes ,usual degree protection ,weather protected motor ,spaces heater,
Area explosive ,classify of hazard ,classes Nd group of hazard enclosure , safety equipment ,explosii proof , mounting arrangement , dimensions , standardized type of constructy Ns consyrucy and
mounting ,painting ,tropicLizd painting ,application motor , induction machine speed ,caratersic frequence control the

- technology conceit ,force applied lenghtt weight ,c
Energy = F× E,distance , C= 20N×0,20m=, 5N× 0,40 , mechanic energy ,
W= f×d,
1Nm=1j=power× time = watts× second power, energy applied divided
F.d ,dpmec =w.tv..

- P= U.U.w. Or ,U.2 O= w ,, P= R.I..
P°U.f.
3Pf=3.U.f..
Delta or star connect ,star connect,U= 3.Uf.e,,u= ufe.i= 3 reactive load ,,
Performance,zone startup limitay ,dolb,power command switch ,start delta
control ,power fuse F21.F22.F23, control ,figure ,T 1, control ,transformer
K#,contactor FT#,overload relay SH1- controle transformer k1, contactor
FT2, overload relay sh 1control button kt1,time relay M1, motor oprional
accessories ,phase fault relay , minimum/ maximum voltage relay ,ammeter
voltmeter ,ohmmeter , starting with delta ,delta power circuit ,starring
switch note output you 75HP(220v),125HP(380V) and #75 HP (440 v)
protection b protection by 6 fuss when fuse ,f#,F2,F3 is equal ,power to
fuse ,F2,F4,f3,f6,F4,F4,poset fuse ,f2@,f22, control transfory ,k#.k#.k3
contactor ft# ,overload relay sh#,control ,kt# time M1, fault relay minimum,
operating on dual voltage ,220/380v,,380/660v or 440/760v ,six
reduce ,25% ,,
- squirrels motor driver load resistivd torque cr.Δi,, Cr ,y
95% ,,Cr,Cr ,,100% , C/Cni/ΔcΔ/ΔCΔIycy,,CΔ/can ratio,torque ,in ,ratio
current ,Cr resistor ,Starr - delta ,,,acceleray Rela
autotransformer ,50%,65%,80%, of motor rates starting torque ,k1,current
multiple,k2,torque, obtained on , F1,F2,f3, power fuses ,F1,F2,f3,f,4,f5,f6,
F4 control fuse t@, controle transformer k1.k2,k3.k4 contactor
transformer ,k1.,k2.k3.k4 contactor ,1ft@ ,e 2 ft1 overload relay sh#,
controle button kt1,time relay M1 motor oprional ,fault, function switch
autotransfy ,80% ,rates,Um/ UN ratio for ,85% ,rates voltage ,up,IP ,85% =
k.1(),100% = o,8;= k2()100% = 0,66, , compensation automatically,,
- electronics starter soft Starr ,,torque relative outcom
Torque × speed , basic calcut rates ,
P(kW),co(kgfm)= NS (rpm) Na (rpm) 70#4. P(CV) 955.O(rpm) can :
rated torque develop,
NM ,co
- dahlander winding winding single , it is applied to connection Y/yy , @/4
ho ,- 4/2 poles , ,,y/y.y
Variations: slip ring motor , 3×pjr^2×R2×I22s= wo× Two
Rotor losses ,A(w) so= synchronous speed in Rs / St = rotor ,R2, resistance
,increase the motor slip (s(

* class group group machine electrical ,IEC 60033-1 are class A(105°C)class E(120°)class B(130°C) class F(155°)class H (180° ,winding thermocouple hotesr ,,measure coper resistance R2-R1Δt=t2-ta=(235+t1)+t1-taR1,, temperature winding change,r@ resistor priore test ,, PTC,,BTC ,cable 20AWG,,3.0m..
- comparation beaten motor protection system caption motor system caption ,unprotected partially protected totally circuit ..
Rated current rated ,overload fixed value ,phase system thermal device of circuit .
Ha specification of electric motors ,load electrical losses cycle duratt time factor = TD+ TN cycle duration factor ° 100%t% ts + TN + tr ,figure ,duty , intermittent periodic duty with electrical breaking ,A sequence of identical duty cycle each cycle ,consist ,a starting time ,a time electric breaking at time energetized rested constant the period short that thermal equtis not reached , ts+ TD+ tN+ tfcycke,duration factor= @00%td+ TN + tf + tr ,duty types ,S3: intermittt periodiu duty A sequet identirest thermaj duty cycle starting current , tncycle duratt factor = 100% TN + tr load electrical losses, temperat time cycle duration ,duty intermit periodic starting ,A sequence identity duty cycle sequence consistevxe time operation constant load time de energized and rest ,thermaj , TN= operation time at constant load ,flux max
= Maximum temperature attaint attaint ,dtn

=Operate time at constant load dr r
= Time at rest ,flux max = maxit, temperature attaint dtn D
Operational time constant time , maximum temperat attaint load electrical losses cycle duratt ,13 ts,starring acceleration) accelaratt time B , operational time constant load f = time of electric braking tr = time at rest ,flux maximum ,..
- duty ,continui operation load , tncycle duration factor = 100% TN+ TV load cycle ,cycle duratt factor ,td+ tn1.100% ts + tn@+ td@+tn#+TF2+tn3.tf@+tfn2.100%.+tn@+tf@+tn2+tf#+tn3tf#-tn3.100%.td+tn@+tn2+tf#+tn3g..n@=g for n2= ..load electrical cycle,non = period,duty type discrer constaing value load ,,
Manufacture agree duty inducau.
Type .
- number of Starr per hour b
- number of breaking per hour
- type of braking ,constant kinetic energy ,rates speed of motor and load , constant kinett..
- loss continue power period time so :
P22.t2+P22.t2+P32.t3+P42.t4+O52.t5+ O62.t6 Pm =t1+t2+t3+t4+t5+t6 continue running intermittent, operational reduced motor cooling effiy directly equivalent power .
Sum (O2i.ti)(Pm)2= sum (ti + 1 tr) , ti= load time ,tr = time rest pi =

corresponding load ,P12. t1-P32.t3+P52.t5+P62.t6 Pm=t1+t3+t5+t6+ (t#+t4+t7),13 Pm2= sum P(t)2..
Power servit factor ,SF, when applied to rated output applied motor , service factor = 1.0 means ,whistand instaneously overload ,IEC 60034-2 ,coolit ,40° , class
- explosion protection enclose code standard IEC 60033-5 definitely of protection Io mm ,2:machine ,12:mm ,4 machine against ,size
Frames size ,level ,4 poles ,+7bd ,NEMA,iex
Charat of frequency: inverte order diode rectt voltage ac,DC regulayv,control type ,,
- specify: 69typical voltage waveform at input PWM inverter with 6 pulse great ,59 Hz or fundamental components ,IEEE ,STD ,,

-**1*.4.1.2.12.* overview.**
TT-TT-T connect ,connect this connection by ,3 phase to ,3 phase since ,3 phase to , transformation ..tree phase supply line voltage , 109 v transform ,DC ,180° , EDA being equality , 3/2)×100=86,6 v lag behind ,90*° load transfo ,KVA rating , T-T connection 86,6% V-V ,connecty two identical unit ,secondary windt are design ,86,6 volt will operating at full rating arrangements ,(86,6+86,6)/(100+86,6)=0,928 if it's rating in other world of kA , utilised to available ,0,928 , connection economic the open ,triangle ratio ,0,866 alterny capacity ,is = VL.IL +(0,866VK)×IK= #,866 ,VL×iK primary phase power supply is = 1,732.VL×IL/1,866 .VL×IL= 0,928..
- secondary connecty voltage nominal voltage of 100v , the neutral point n is one third way and current vector diagram fund voltage by ,30° ,accross one half but lags voltage by 30° accross , balance load of ,of= cos applied teaser ,(30°- flux),and (30+flux) the situat is Sumit that in V- v connection ,two ,T connected transformer are used to a 440 - v ,33 KVA balanced ,3 phase , p.f = cos applied ,main transform voltage .
--- bakabced 3 phase supply of 3300 v calculate ,where ,
Primary bis = 0,866× 3300=2858....
ILO= 33,00/3330×=5,77 secondary main voltage teased , 0,866× 440 = 381 .
- 5.77(440/339)=43.3 ..
KVA= 330×5,77×10-3=19
KVA teaser ,KVA = 0,866× main KVA = 0,866×19=16,4
_ the primary n# turn is connected supply if supply line volt is v , the VAB=VBC=VCA= V but voltage numbers turn , (3/3)N1: form making volt / turn
/2/3)vc-= 0,277v or 0,29 number of turns equal to 29% of N1 since ,0,288 on third of ,0,866 let the teaser secondary supply current ,I 2T unity power

factor magnetic current , primary ,
I1T= I2T× transformser ratio U1T= I2T× 21212/+3/3)+3/2)(/) tnnni=✓×✓= 1,14(n2/N1)i2t= 2,15 K12 t ..
- where k= n2/N1 transformer ,
----_____
Scott connection calculate value of the value of line current on the 3 phase the load on the ,2 phase side are 300 kW and 450 kW both at 1000 v ,and 0,707 p.f lag and 3 phase line voltage is ,3,300v the 300 kW load is on leading phase on the side neglected , tease, k = 100/3,309= 33,25 ,,k= 100/3,300= 1/33 ,teases secondary it = 1,25 K#2 t = 2,5 ×(1/33)×6369=221,8,, main rectant components ,transformer ,112 ti= 2211,159,5772ttkiji×= now ,
- in

* **1*.4.1.2.14.*overview: Engineering system division : middling assessment for policy .**
Lecture note sylabus, assignment.
***Key:**

Ses|. topics | lecture note /
-1***.4.1.2.14..***1. introduction :
-2.science and policy : a brief overview
II. Framework analysis tools:

3 .modelling for science modelling for policy
4. What make scientific information effective in policy .
5. Framework sciencefic assessment.

6. Framework : science,policy policy and
7. Framework ,science policy and public .
8. Framework risk assessment
9.framework : precaut.
10. Project preparation ,no class
11. framework adaptative management
13 air pollution science and models engineering electrical
14. environmental modelling environment.
Guest lecture .
15. Rains negotiation exercise.
16.. case study Fisheries and ozone
17. Humanitarian logistics
15 .rains negotiation exercise.

16 .case study fishjer and ozone .
- 17.projecg checkpoint II
Case study : science ,chemicK s
Case study climate , engineering electrical
Summary and application.
- synthesis across cases .
- term project presentation
- term project presentation b

*__1.4.1.2.15.overview: assessessment, specific of studies are required for various professional field find out more tthese award in the chart. Award|certificate| undergrads|diplo|deg__r

Type |. |Certificate|
_ institution | vicaty and technical school community college || 2 and ,4 years college and university|| vicaty and technical communy || 2 and 4 years college and university
- completion time : 1 years ,years , 2-4 years more
- career field : technical and vocational field , enhance professional skills or specialized in a real ,technical professional requirements undergraduate or graduate undergraduate or degree graduate.
- certificate vs degree
Evaluation table project : ... Name of ,spliea ,date ....
..bid price 50 max
-experiementa
l,staff equit ,work programme 10 max
Location. 10 max
Total points. 100 max
Bidders lowest and ,.add
- qualicafition evaluation summary: (pass fail criteria
.- qualicafition topic:
 -specified criteria application explanation:
- prequalification docuy.
- nationality:
-Conflict of interest:
-financial institution ineligibility:
-goverment owner entity
- United nation resolution borrower.
- historical of non performance contract.
- faillure to sign contract.
- pending litigation.
- financial performance .

- average annual construct turnover.
- if the applicant fails a specific criteria if pass has been given accepting a minor deviaty the reason cleared explain b
- table qualicafition evaluation summary ,pass ..
Name of prequalification:
Application : .....
Deficy to be rectified to the emply satisfaction ,etc ... Name apllicay , reason ...- 5.1 table .bid identify read name representative signature v,completeness , substantially, responsive acceptance for detailed examination ,a,b,c,d, explanation b

1*.4.1.2.16.*
overview: assessessment, specific of studies are required for various professional field find out more tthese award in the chart.
Award|certificate| undergrads|diplo|degOverview radiotechnic:
representative angle
Modulation : scale frequence dephasee report 90° angle .
- notion general angle axes .
- I (in phase phase system pal note U, 90° report axe systeme.
Schema of Principe.
- signal modulant I -- modulator Am ,signal I , signak modulate ..
Oscillator lorteuse .. dephasoe +90 ,
-signak modulant Q , modulator Am signal Q ,,signal module ,A ,, signal module en quadrature .
C representation U= f(f)..
Band lateral ,band passants ,porteuse ,raises ,soectrales ,Bande latert superieuse ,f frequently,(x) , tension (y) canal devrint ..
U : value crete voltage .
W : pulsation (w= 2 .π>f
t : time consider .
Jba gjev
Schematic block modulator :
Signal modulant inpout porteuse ,modulator output module ..
Equation b.
u=U^.sin + omega+ time + alpha .value instantaneous voltage

_____
-* overview: Automatic lineare , system asservisment
- instability execution order give or existing
Positive reactt positive: €= yc+y , stability system asservis ...- precision mean ,ecart ecartometry € input consign yc output y of system.
Low rule command proportional of type ,u= k.€ ,for have precision ,gain high ,value command u , perturbation v,error residual ,memorise , stability contradiction ,process measure,Rapide ,stable automatically , compensation

incertitude old , system ,no precision..
*Key : modelisation of systeme linear.
Characters static , relation between input and output system linear, dynamic system ,Regin transitiire ,response output, linear system scaling u(t) input on constants ,y(t) function ,u(t) ..
Donne , m o(Vo,Io) fund diode ,
-system of first order,system first order , equation ,1 order .
- circuit ,RC .
equation electrique of system.
VE= RI+ vs .difference equations first order input and output,€ , RC , DV s ,,dt+vs =vE
-esucation different system , € ,t ,,Dy(,t).DT+y(t)= Ku(t).Ea
- functionalite transferet transmittance system lineare report transport la place .
Transformer de la place ..
€.t.(p.y(P)-y(0-))+y(P,)=k.u(P).
..
Regime static ,regime transistor response ..
System causal input y(t) instant ,t onvalue ,input output t< t0;, physics
- defined : UN system time invariant model identiquw ,
- definiy: UN system ,instantat : y(t)=a.u(t)..
Function transfer la place , to .
T,(,p.y,(P)-y(o-))+y(P)=k.u(P)
Y(P)=k1+t.p
- performance of system asservisment.
- precise.
- quickly of system
- proportional and correction
Integral proportional and corret ,
Derived integral ,transformer of la place
-e(t)=E.u(t)
.. asservisment position speed ,,ampli servo valve , Cator position,detector , Vo= CTE .
Asservisment , stability of missile of plan vertivt
Variator of speed programmable automate motor ,coder..m- servomecanisme : system asservi recall servomechNic if same unity control mechanism posity,speed ,torque ,
- system motor motor asynchy ,started automate PLC ,captor reverse forward ,
Watch motor ,linearisat system , Qmax ,valve b,a mixer products ,, characteristics load ,make linear.u(t)=A.u(t) system
e(t)=u(t)s(t)=u(t)=A.u(t)

*DC motor : amplification parfait
e(t)=v(t)s(t)=t
Motor speed rotation w(t) ,voltage command v(t) torque constant

couple ,R,fKc,kt,jK coefficient motor and mechanism
=+W+w+w+w.
2.cT..Tdt, d(t)..K.j,,d(t)..
dt,,d(t)(R.fK.K)(t)(RjK d)k.#..vt
-cdt,,dtv(t),(t).b=w+w+w
0.dt, d(t)..DT , d(t)..
W=S=S..
V(t)=A.S.(t)..
*Non linear test DC motor , characteristics ,C1,c2,C3 motor no load loss move torque, Vcom ,v (volt) ,,w (Rd/ sec)
, vs # , vs #, vs 3 ,,
- saturatof amplification: system input output unity ,vin,,court
- conducts electrical ,materials
Lohm ,response linear potential difference ,Yb,dipole ,instant ,t ,U and I verified proportional
U(t)=R:I(t)
R resistance , system and,G ,,G= 1= R, aspect ,,
PJ= R.i2= u.2'
- system lineare verification system surposituij
(12)+1)(2).Fae,,+be=aFe+bFe, e1, and e2 input signal incase of , input e1 out put s 1 = f ev
e1+e2 output ,s=s1+S2=f(e1)+f(e2)..
- regime perment . Circuit power

...

to
me

Coulomb low,
1v=1j/c ,,,D ,V1,,,V2,
Circuit,
Force of la place ,f=q,I.E
V#iV#>0 , Io= dq#,DT
=I2+i2,,mail low
Vab= VB,I Va input a,c v2 output , v#=VC .Va , v,v2= VB I
V2+v2=vc. i. va,
- dipole ,A1,A2:
Simplement ,,h(t,u)=h(t,u)
Y(t)=z+1,j1,h(t,u)x(u) du
Invart,y(t)=h,x(x)(t)
Spectre signaux , door x(t) signal time continue ,

x(t)=X,n2zZ,xn=1.T.Z,,
x(t)eij1/4.n.t.
Transformer Fourier of x ..
(T),x(t) eij21/4.n.t
T.dt=#.T.Z+T=4.ji ..

-Transformer of Fourier...
TF[(x.y)(t)-
TF[(x.y)(t)=z+j.1
X(u).y(Tiu)du,eij ,2.1/4.9
Z+1i@,,Z+2i1..

x(u,)y(ti.u)eij2.1/4.(t.iu).e.j 2.1/4: to
- impulsion de Dirac ,
Definition: impulsion transformer 2 design impulsion of diract
transforms Fourier ,
TF+-,(t), design of functy uniform egale ,1 of I Rv,construction

Signal time continue ,TF(x(t)+(t) ,transformer product ,
TF[x(t)+-(t)]=Z+1,i1
X(°O)@(°i°)d°=Z+1
X(0,)1(°i0)d°=z+2,, TF=

...

- linearization: deux ,
TF(x+y•)=TF (x)+TF(y).
- decalage in time frequency ,t0 real strictment positif ,
TF[x (tit0)(:
TF[x(Tito)]=Z+,ij ,x (u)eij,3.1/4°(u+to) du ,
- transformer of Fourier ,.on note x0(t)=dx=DT,TF[x0(t) =dx
=™DT.,,TF[x0(t)]=Z+1j#.

- period , frequency signal x, ,, periodic of instant t0,x(to+T)=x(t0),, interval of time T ,,
f= ,1.T...- energies ,power ...- Energi ,signal x(t)
time ,continue ,R+2i2jx(t).,j2 DT converge ,integrals energies of signal ,x13 ,Ex ,C= ,Z+2j+2,,
Jx(t)j2dt,,.power for same time defined,power note px , = Lim u +2:,2u ,Z+u,,jx(t)j2dt..
- period integral ,xT - period vPx ,c= ,,
- R+2,j2+2,,i1 jx(t) jdt convert,,

...

*__1.4.1.2.17.overview: assessessment, specific of studies are required for various professional field find out more tthese award in the chart.__

Award|certificate| undergrads|diplo|degOverview: framework qualification

Work of work and labour education of labour skill training compare , framework study school and college university work studies topic learning integration system high land Scotland outcome land reform
Council.
-engineering assignment Scotishb,
Unity qualification.
- added value unit ,
-;develop .. Engineering context ,mechanism structure,electronics and control.

-added value unit development of skills for learning skills life for work.
-conducting the assessessment under , assigt career .
- judging the evidence : evidence internally marked verification staff guidelines.
Completed solution .
-re - asssessment: in relation to unit re - assessessment future .
- outcome:
Developm ,with an engineering solutt which draw on apply and knowledge of mechanism structure and electronics system .
- analysing a solution ward problem.
- design a solution to the problt
- simulating or constructing a solution the problem.
- testing and reporting on the solution to the problem.
*Evidence to unit will be generated thought an assignment which learner and apply assignment will assess learner skill in analysis,design the problt simulation construction.
..
Candidate name :
Class:
The candidate should a least half of the availability point for operational skills and at least hyof the available points for reasoning skills across the test as whole..
-Part | questions | operational skill reasoning sil

- totaj point achieve process and accuracy ,
Total ..

Course the .
- topic | level | level
- questions | points of process or accuracy | expected response ..
.correct answer award | over akk |™
Table completed
Correct time in hours
Correct formula
Correct stragi ,
Correct evidence of appropy and multipliy , .
Check length ..
C
- correct answer .

- judge 1, judge 2,

_ apply skill course module subject and analyse modules v
- outcome and assessment standandar outcom ..
- core purpose : superviy and mentor studeb teacher ,provide
training ,suport of student teacher during work integrating
- core functions :
- key attributes =
Accredited assessor training the ,,
National circulum statement grade representative policy statement learner

_____
- overview challenge
Emf vs potential difference potential learner ,E source energy supply
E= Energy / unity charge,
E=ΔW/ΔW/Δq
Battery internal resistor = €- It
€-Ir
IR=€-Ir

Key equations :
Req= R1+R2+R3+....RN-1+RN=Sumi=1.
N, RI

Sum = 1N1Ri
junction rule ,sum In = sum out
Loop rule sum V= 0
Terminal volty of N voltage source in series ,V terminal = sum I = 1N.
Sum - ireq .
Terminal voltage of N voltage source in parallel ,
V termint = sum + I sun = 1
N -1= sum - Ireq, charge on on a charging capacitor ,
q(t)= Ce

|1-e-tRc
I= Q,, 1- e- t..time constant
Time constant t = RC
I= €.Re-tRC=Ioe-tRc
Charge on a discharge capacitor ,a(t)=Ae-time ×.time constant
R= P.L/a.. resistance is measure ..
Resistivity = resitivit ,o [@+alph(T-T0) ..
Vo..
Norm
...
I
_vo.vrn = 0,707vo and Irms = 0,707 I.
1/R=1/R1+1/R2+1/R3...

..m.v.= u×R=sin w×t
.m .L.d IV = L= v× sin. wt.dt
Vi= sin w.t.L
V.i= - cos w.t.w.K
π.i= i× sin w.t- (current lag by 90) 2
WK= 2. π. f= X= inductive reactance
A.c capacitance.
C. DV.×di = c = c×.v ÷sin wt.×dt×dt+112wc
π= i× sun × at + current lead by ,9!0°)
11=X == capacitiver , reactance ,e.i.n .w c.2.π.f.c
-j' operator ,j is operator rotate anticlockwise, 2 j = -1, j = ,I ,j represet ,
rectat or cartersian form : - Va job -->= +-
2. Rectat or cartersian form
2. Polar form : v.v Teta = < +-
Trigint form ,cos ,sub v.v .j
Expont form : j.v
Power triangy ,222s= P+A
S= V.I×U= I× 2×Z..
P=I.×2.×R = U×2×Z× cos flux
Q= I×2×X=I×2×Z× sin .flux = V × i× sin .flux × varv,,

Z= R+ 2π×xl .------
DC machine fundamental ,induced in coil ,e= -N.×derive flux / St .volt
Emf induced in a conductor ,e = b.×l.×v
Force developm: F= B×I×K..n
- electrical energy ,en = v× i× time ,w hour
- electrical power (active) ,O= V.I watt,
- resistu of conductor ,R = resistivity,× length / a ohm
Magnett force ,H = N× I/ L. At / m
- flux density B = flux / A..
Electrical field intensity ,E= v / DC / m

* Introduction: cc machine is a device which converts mechanical energy into electrical energy ,into energy and vice ,
A ,100- kW ,250 - v DC shunt generator has armature ,o,o5 w field resistor of 60;
- voltage determt the induced ,voltage full load , VT= Ea- Is.Ra
If= 250/60=4,17A
Il_fl=100

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to
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Ia=IL_FL+If
EA=VT+Is.Ra
,P = no rotor poles ,number revolt.
N=speed of the rotor in rpm ,number of cycle generated in one revolution = P/2
Time taken for one revolution= 60/N second
F*=On/129
P= no poles ,
N= speed in rpm
Toh= no of concentric turn
KD= distrt factor
Flux = produced per poles armature , flux P = derivatives flux time take revolt = 60 / N sec = St there fore,
Average EMF inducey in conductor is given by
e= deruve flux / derive time = flux poles ,/60/N =.2 flux × P.N. volt
Therefore ,f = P.n /129 for a sinusoidal AC volat AC voltage
RMS ,value = averau value × form facty ,
The value a form factor ,in case of sinusoidal ,RMS ,value of induced EMF per conducty ° 1,12× e= (2 flux) = 2,22 ,flux *
_____&

Instrument measure
* Deflect torque.
B= flux det ,wb/m.m
L= lenght or depth of coil .m

b= breadth of coil
N = no of turn coil
If a Currey Amper flow in the force acty ,
Force on each ,F= B×I×L×N.. Newtown
Deflector torque,TD= force × perdinculare distat=
B(BI.l.N) × b
TF where ,A= l× b , area of the coil in ,M2 instrument is spring controller so that TC ,alph ,Teta the pointer rest a position where TD , there ,flux alpha ,In

Construction,pmmc coil carry ,current shunt ,
RM = internal resistu of movet ,coil in ohm
Rsh = resisu of shunt in ohm
Im = ifs = full scale deflection current
Of movey
Ish= shunt current in smper
I= current to be measured
Shunt parallel with meter movement the voltage drop , across shunt and movemet must be same.
- Ish×rsh=Im×Rm
As×Ish=I-im
(I-im)=(I-im)/I'm
RM/rsh=I/m-1
1/m=1+RM/rsh
1=I'm(1+RM/Rsh)

I/I'm ,,is multiplication power shunt ,
Voltmeter: for measuring
- movement in ampere
VM= full scale deflection voltage in volts .
RM = internal resistance of movemy
Rse = multiplier resistance
V = full range voltage of instrumy
V = I'm (RM + rse)
V = VM / RM (RM + Rse)
V= VM (1+Rse/RM)
- deflecting torque , derive flux ,under deflection ,TD
Mechanical will be done
= TDD,flux
I= initiy Currey
L= instrument inductst becaut the magnet field
- flux = deflection
- derive flux = change in deflection
Derive current = change in current
Derive induction= change in nductancd
The EMF induced in coil given by ,

e= d/ dt(Li)
= IdL/ DT+Ldi/St
Multiply ,idt both , eidt = i2dl+list, the total energy supply to the Mi instrumy the stored energy increased from , 1/2LI 2__. 1/2(l+ DL)(I+ Di) #..

_____&&&
E= P×flux×Z×N/N

...

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-**1*.4.1.2.18.*overview: assessessment, specific of studies are required for various professional field find out more tthese award in the chart. Award|certificate| undergrads|diplo|degoverview engineering,safety ,security ,polic**y procedure ,mil norm ..
Engineering: low and unlow Labour
National framework qualifications Engineering mil operational.. specialists safety and security engineering technical support logistics ,defense offence factor norm standards commissioning assement police safety security commissioner and non commissioner development rural offence resolve regulation system integrity non integrity system brigade instructor warn equipment design fire protection npfa.

*Methods research and investigation low rule engineering,research report scenario investigation occurred land case study mil ,police

* Introduction to systems engineering management:
- system engineering management in did acquisition.
- the system engineering process overview.
- requirements analysis
-functional analysis and allocation
- design synthesis .
- system engineering process outputs.
- system analysis and control work breakdown structure .
- configuration management.
- technical reviews and Audit
- trade studies
-modelinf and simulation
- metrics .
-risk management

Part,: planning organising and managing .system engineering planning
- organisation integration system development.

-2* function analyse architecture ,toold define illustrated ,
-functional flow block diagrams definitely task , sequence and relationship diagram define process data flow ,
Time analyse time frequency architecture vtop position of systeme functionalite ,
- functt performance requirements
-: Engineering functionalite analyse and allocation process , requirements, requirements.
-
- the functt analyse .
Second level : basic functy requirements..
Mission requirements:
Performance mission:
8 Min ,1 Min ,75 Min ,5 Min
Okm, 0km ,50km , 0 km ,0km
- allocation : perfort requirements: allocated to function ,
- a simple rule ,look functt ..
- understanding of the scope direction of the effort ,
- function archiy : troop in squad level unit overs of 50!, kilomet troops must within 99 minute from time of arrival transport,
Transport of troops illustration preliminary functy archiy .
- summary points : functyanalyse Hugh kevej functionalite analyse allocatt sits of decomposition of high functy ,
- there many tools avait development
- functt flow block dit timelint.
- analyse sheet , requirements allocation sheet,
*
-3. system fundamental :
Source evaluation ,proposal a,proposal,proposalc
-evaluatiin criteria factor % ,rating score rating score
A. Technical requirements: 25
1.performancd characteristics.
2. effectiveness caracterist.
3.Design approach

4.Design document
5. Test and evaluation approach
6;product support requirements
7. Product layout .
8,manufacture process
9. Quality control assurance:
10.Management
11.Planing plan scheduy

12.Organic structy
13. Available personal resource
14. Acquisition price
15. Management control.
16. Acquisition price .
17. Life cycle .
, priority experiemental .
Past perfot .
Grand totaj ..

- manager consideration and summary valuation criteria,life cost point
9-10 efforer has completed cycle analyse that support their proposaj.
7-8 offered didn't including life cycle cost analytbut has support design approach on the basis life cycle life,cost was not address in offer proposal evaluation factor are listed relative important , evaluation quantitatt,those qualitative to arrive at any integration assessessment, government to make fair resonner ,limited number of evslut factor to govert,reaut,soi,/ specify of cost there is not sufft space here attemp ,
- is the supplier proposal responsive to the govert need specified supportive of the system requirements in system .,
From the system leveh requirements ,have effectively factor been ...

- semester architecture developm
 completed implementation archiy, preliminary ,, course

Aurum trimest ,winter trimest, spring ,summer , trimester credit ,years second years

Defence system and technology,
- electro - optic HP. Systet and hpc application 3
Computation material design
- studies interdisciplinary.
- introduction to terminal ballistic.
- faillure analysis and maintenance
- improvised explosive device disposal .
- logistics.
- electrochemical power source for military applications.
- naval shipbuit.
- system engineering for land vehicles.
- future module in any
- high - power electromagnetic.
- technic optic
- infrared technilogie and applicat.
- laser technot

- laser system in defence

- HOC system and HPC .Min
- hardware archiy HPC
Hoc technique and software development.
- parallel computing for multi scale multy physics problt.
- special applicat of hpcs defence technologie.
- advanced numerical mathematics.
- computation fluid dynamics
- computation electromagnetic
Computation material design.
- continuum mechat
- material advanced processing technology.
- simmulatung high strain
- computation design .
Simulation design of surface and interface.
- statiscal thermody interdisciplinary.
- tactic and strategy,leader and psychopedagogie in orgau,
Nutzungsmabagement .
History ,policzj ..
----------;&----------
High shock ,most model survit level ,5000 or ,@000 g , specialized , 12500 g for crystals ,30000g oscillator b,
- high temperature b:
Military high shock applicatv

---custoner requirement :
Rigth frequence tolerance ,rigth frequence stability over wide , overtone resistance ,
- table ..
Microelectronics device :
- microelect devices environment range.
- military product operating environment requirements.
- thermal shock test
- temoerat cycling test .
-acceleration extrem
- vibration fatigue
- pratical industry specifications for autoclave testing .
Us conformaj .
,- coating sake
- application / threat vs device requirements ,
- estimate extrem envirt parameters for army , tactical mission
- high temperature storage requirements.
- advantages and disadvantages .
- requirements.reluabilirt maintenance standard ,,
- electronics evaluat research laboratory ,air Force ,product integrity issue

were mostly assembly related reliability testing can induce failure , assessessment methods focused ,lifecycle problem adequate.
- address other faillure that occured later product cycle due to operating ,non ooerat ,storage or dirmaxt ,else now investigation new method reliat assesment includ physical faillt , prevent detecting and correcting faillure associy design manufacture and operation and product requirements include requirements exposure , to stress temperat humidt ,how the products bfaik reluabit conductt ,, cause fatigue distirsit of assembling of seal due different coefft.thermal expansion.
- electric proput system of a main tank can reach ,temperat of up + 200°c aircraft operating temperature can +399° with mil - STD 883 upper limit of +125°✓must employees cooling measure , cost moisture

- test method procedure for microelectronics. Solvent based urethane acrylics moreover ,suliconf ,automoy,industry usage coating defense ,switch silicone defense continue continues used production life cycles ,radiatt,hardness assurance,,
Developm of commercial grade that electricity can also cause electronics faillure ,ekectrimabt and electrical failure mechanisms from high tempt Non operating , environment,are storage resident ..
- acceleration extremes in transportation
Mode acceleration ,g , frequency,Hz ,,truck 7300,aircraft ,railord card 1300,ship169,test conditt,source pecht ,
Test ,condition ,Min test time
Hours ,A 2996, b 50 o6
C 70 96
- source ; Mil - STD - 883D ,1991
- detection test ,test , conditions,peak, acceleration, frequency,Hz ,source mil STD - 883D ,199911 , partie , impact nose detection test is used to detect the presence loose particular electrical , hermetic package,measure the sound Corning ,milsoec ,vibratv,
- shock vibrat researcher have softt based subject ..
- engint..
- Motorola intel , research data conductor integrt lead plastic dusk in line packai demonstrate no device degradat after exposure levels bof ,300 applit threat device , requirements,ICBM ,and strategic interceptor .missile
- primary , neutron irradit ,dose rate upset / survivabiy ,secondary ,total uonizing size ,
Neutral irradiation> 2013 n / cm sqr
- dose rate > 108 rad/s
Total dose < 10 kras (si) , military surveillance , navigation and community sateliy ,primat totaj dose ,total dose ,dose rate ,neutraj error / bit day
 Neutrons < 1012 n / cm
- commercial monitory satellite ,primary
SEE

Totaj
Total dose (nuclear weapons environment,new
Secondary ,
Total dose (neutral neutron proton .
See ,< @0< error total dose * environ 30 k rad (si) , #0 krad
- tactical milii system includy avionic
- neutron irradiation
- dose rate upset latxhio .,total uonizing size ,dose 20 rad second
Total irradiation 1012n / cm .sqr ,total dose < 5 krad (si) , see < 20"9 error ,but ,day nuclear react controle and scienty system. Neutron irradiation.

Mil - HDBK - 217 reliabit, retain changev clarification cancell IEEE other

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to
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-**1*.4.1.2.20..*overview: assessessment, specific of studies are required for various professional field find out more tthese award in the chart.**

Award|certificate| undergrads|diplo|degoverview : general . information
1.1 standandar. Purpose and structure.
-support documents
- wath does ,accomplt
- applications
- benefits
- challenges.
- contract requirements.
- definition
- program element
- defense material item .

- common elements
-level identification
- program ,WB's
- contract web
Web evolution .

Selecting webs element , determination level of program , creatt dictionary , avoiding pitfak ,
Additional , solicitor and proposal
Contractor managey control syst
- acquisition logidt
- planing programming
- life cycle cost .
- procurement
- reporting .
- contract statement of work
Mil ,STD - 881E..
2.5 requested for proposal
- preparing a preliminary contract .
- solicitat requirements.
- extended contract .
- integrated cost schedule technic performance and risk .
- contracts instruction .
- developing .
-relatiin , program.
- subcontractors .
- contractor.
- controle account levet.
- programmatics issue development.
- system of system
Family of system .
Cybersecurity
Softwtand software intensive system.
- information system is defense business systems.
- softy operating on specific equipment.
- vidibit into softt development process.
- integrated master plan
- integrated master schedt indc
- imps .IMS likakGd ..
- use of common elements.
-inplementatiin of contract work breakt structure
- contract award and contract approval .
- reporting relationst.
- numbering of
2.integrating assembly test and checkout systt ent program management system test evaluation.training and data ,applied appropriate WB's ,

Government support specifications configuration may csci ,
- include .
- software requirements , software architecture and dest .
- software integration, software architecture and design.
- software code unity test .
Software integration , software qualifications, government off shelf approat compony assesmy , radioisotopes thermionic generator elements emissions using nuclear energy space mission distance,
- power : source elemet associate with , electrical power generator hard not include item non recharge and fuel ,
- power control : switching and distribution junction switching and DIST units , junction ,boxes pyrotechnics initial ,valve ..
- power conditioning conversion and regulations collection of item condition conver ,and regulations vehicle
- power disst of iteb.
Rechat batteries collection subswut .
- charge Controller electrique energy battery converter chemical energy during discharge energy into charge controller ..
Harness cabled elements is the collect of item used to route and provide electrical power and signal through the space ..
- attitude controle subsyt element Nd control space position velocity
- communication ,play load .
Attity determination attidevtracker sensor ,sun inertial .
-development test .market research efforts or proof concept test and evaluation ,
- technical feasibility.test
- produi prove our test ,pqt and evolution, test and evaluation final eny.
- production evaluation .
Software development test and evalut test , interoperability.
- soldering protection.
- technicK manuej .
- production .and evaluation v.
,- comparisy test .
,- quality confirm.lot
- operational test Nd evaluatt conducty

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-; underground of ammunition and explosive :
- sympathetic detonation rock soak.
- the minimum separation distance to prevent a sympathetic detonation is based assumption spelling rock velocity.

Initial in a series of laboratory test reports minimy impact velocity for projectile impacting on bare TNT is 500 m / s in order to cause detonation charge ..
Ref | impact velocity m/s | remark
- joachi | 120 m/s| quoted impact velocity
- metaj absorber technical necessary source cable couple with low frequency low circuit mu metal is effetv, saturation.
PKd>PTX+GTX-TXFL+ GRX-AC lR- Lp- itdB..
- PL(d) path loss between secondary 5 G ,TX and primary ,separation distance tx , power GTX antenna gain ACLR is the 5 G adjacent Chanel case penetration..
- parameter for coexistence.
Satellite system |✓system parameter.
- Freq = 3490- 4200 MHz ,f= 3600 MHz
- bandth | 40 khz
- priority | priority systet
- orbit| geo
- antenna diameter m = 2,4
Antenna height hr | 5
- elevation n | 20-59 Europe
- earth stat Sten |™max gain is 32 db toway secondary ,0,5 db(slp20) , recommended,54
- permissible interference| It= - #170,0 db recommy
- terrestrial syst| parameter for cell base station,terminat
Euro dBm | 10-29 small cell up to ,23 terminal ,D community.
- feeder loss (db) #
- penetration loss db | 19 db
- bandwidth (MHz | 2,4 in calculation
- priority | secondary system
- antenna pattern and gain | omnidirectional vterminal ,3 db
- antenna height hr ,m | @,5/ 2,5
- ACLR | 45 ..
Station ,35 db typical ,
Cochran distance ,
PLd=A+B+C+ different 2 log 10 d ,+ diffdrdnce 2 Sept

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Overy police operaty support to army operationel:
Operationel support.
-the police operations discipline.
- principle of police operation
-rulrs of law.
- command and of army law enforcement.
- operationel environmental
- unified action.
,- police operations across the range of militairy operationel.
- support to unified land operationel.

- support .
- police operations integration.
- sect ,plannit preparing executive assessing police operation
- planning, execution, asssessment.
- sect : organizit for police operation
- base and base csmpd.

- patrol area and patrol distribution.
- manpot and mission requirements.
- sect : police operationel capabilities.
- military police formation
Police start capabily .
- police start.
,- detention cell operationel.
- army law enforcement compliance assessessment lrogray.
- police information mNagt ,legal consideration
- non army law enforcement information system.
- police start construction consideration.
- general requirements.
- reconstruction of host nation police station.
- policy measures and strategic,Las enforcement measure, physical security measure,crime prevy measure,
- policing strategies : places ,based approach, problem based apory, person ,focusedt approat, community based approach,intelly based approach, environment approach.
-law enforcement: law enforcement patrols ,patrols methods, law enforcement patrol strategies,
- traffic enforcement investigation .
- crimit investigation .
- interview and law enforcement interrogation search and seizure.
- law enforcement raids.
- drugs
- apprehey by army law enforcement.
- report writing.
- court testimt, customer,
- militaire police to civil security and civil control ,civit distrt control.
- military police operation
- plannit and coordt.
- collaboration and fusion
* Trafft manager and enforcement.
Supply,planing ,traffic control ,traffic , traffic enforcement, yrafft collision invest.
* Evit and forensic support support : .
Analysis Nd capabilities.
Key activtie.
- identifict preservation and collection collection of evit.

- safety considerations.
,- laboratory support.

- low enforcement and policing operationel within the context of the range of militt operations .
- operational framework.
- police operation across the strategic roles.
- the operationel process.
- police intelligence operations drives police operations
- activities of assessment.
- example a small military police station.
Large military police start .
- ex of layered protection .

2. Operationel support to army operationel: instability risk face leadert,political,urbanizat completion resource,conflic persiyancd .civil security and civil control population
- transparency: police established pricipltintebt corrective actt does mean allow public access to police filed information regarding ongoing invest ,rather transparency ensure personal policies and aspect of policies police irganit accessible to the public , detention operationel operate withstand public scrutiny leader balance , operationel security requirements necesst.
-assessment : police activit operationel bassess cause effect versus benefit analyse using trend ,pattern and associate data police personnel, military police usacidc element continuously asses their activities in supporting of establishment order determt the progress measure against establit measure of effective,the allows leader to adjust the application of police resout these assesmt develop awareness . initiation judgement in police persont and organic identify .
- societable behaviours :
- rules of law : is a principle under personal instt and entire ,public and private,include the state itself ,account to state public ,Las limited power of government by setting and procedures that progiy accumut autocrt power.it didactic government conducty according to prescriy and public,method to estably enduy peace at stabiy generally rules of law exits monopoly .. Functt.
- police operational : in certain operationel environmental military police operate organise capabilybpolicd number ,operate civilian police from relation ,UN ..
- command Nd control of army law snft : Commabd or support relationship structy army law structure or suppot relation structure for army law soeciy operationel envirt and mission ,asssr .
- operations bpolicd in support of nation ,the exercise of command control over military police force perform police in support hn population is proviyby three primary echelon of military headquarters units ,militaire

police commander ,militaire police brigade,and battaillon.
Team.
- operationel framewt: foreigy law et author counterintelligence,expaytheir police operations to protect power projection ,platftto ensure friendly ,security measure..
-
Police operationel ,restore to governst,support to governance , insfracture development,conducty.
- police operationel support to decisdvd action : execute simulation and continuous of offensit,densivdv task maintening of action provided protection force ,consolidat ..
- offensive operations : is an operational to defeat or destroy enemy force control tersin population offensit operation be conducted across the range of operatit.duevintent
- defensive operationel: is operation to defeat an enemy attack gain time economozd force and develop conditions favoi for offensive or stability operationel ,police during defensive ,relative stable ..
- staby task : stabit operation is operation in coordination instrument environment lead letimate government with letimate police force ,securtb..
-ordsr dissemination and transited : review prohit plans write police order develop ,o plan ,opord ,,
- troop leading. Procedures: leading procedure is dynamic process used development periodic are typicaj solve tactical probleb when work alone or with small Groupon,compagny commended ,officer leading procedure communication,Sergent.
- preparing : consist of those activiy perfot by soldiers to imprt their ability execution and operation prepare create conditions bfir succesvrequure , Improve situation , training on and become proficient in law enforcement and policing critical task integration organisation and configuration police operationel criminals activities to prevent, investigation general intelligence requalification decisions majr,
- execution: is act of putting plan in action by apply combat power to accomptthe mission and adjusting operation based change in situatt commatand staff understand execution progress.
- asssessment: is determination of the progress toward accomplished a task ,creating a condition or achieved and objectives, assessessment precede occre other activtie b, determine boversll effective of foorce deploy , monitoring situation to collect information, evaluation progress toward attaining Nd state conditions achieve ,us continue activity visualisation sequence review planing,primary tools , observations estimate,dvi
- measure of performance : a measure of performance is indicator used to meast a Friday indicator used measure used action task accomplished .
- properly measure performance, mission statement typiczj
.
,measure effective; clearly statement not .
-; asssessment incorporated quantitative ,object and qualitative nature

objective information that provides insight into measure of performance. Measure based ,
- police operationel inyegt relate measure effectiveness and indicator overall, developm train, policies proficiency increase or decrease.
- number of police academy classes,number of police radios ,number police capacity ,number police academy class offered,number of certificate police offered,number of operationel police station,number of incidence reported,number of incidence respond to number of patrol conducted,are police cOable of self sustaining, administration logistics,number crime category,Robert,public felling security increase ,decrease,reduce traffic, traffic through, traffic rate change or roadway,citizen initiaj communication,
- base and base csmpd : in support police Opera section commander or sndury base overseas composed detachment and augmt department ,los..
- provistv marchaln
,- operationel integration conduct base treat for camp analyse development forensic team manager ,..
- military police : duty officer duty is police orf senior .non commissioner performance vlaw enforcement duty during non duty ,army regulation,local police duty senior leadership brepresentative love,control law
- complain levek complied by day and hours ,time crime or complain ,complain occured day of the week crime or complat occured ,time number ,total ,Sunday Monday
-day offence enabled informed decisions regarding the distribution of patrol and other law enforcement resource established proscty measure reduce and optimally prevent crime from occuring again..
Complaint levek complied by the month month ,totaj *% jusnery to December b,avreragt number complain report per day ,5:5; change ,increas e patrolling ,weather variation in troop ,strength , population change , previous offence types occure similar pattern attributes deliberately applied change by army low enforcement, movement into ,another change area interest significant population shiftbpoliticaj socisj event caused event. Crime complain historical b..
Data patrol distribution requirements traffic ,staff have crime datab, securite brelative .
- crime mapping : geography analyse documents activiy incidence time date exact depictb capable control nitrogen base fertilizer ,color pins ,stickers inform system identification distribution bcriminal activtie,police intelligence analyse army law applicability h,basic equipment facility ..
- police station : enforcement low communication operationel investigation employees temporary detenty of subject logistics bnot required in civil support mil ,
- police desk section: conducty alarm monitoring ,control detained persinabmsinten ..
Low enfort investigation: of criminals activities matter which military operations environment.
- program development: crime that are most susceptible crime prevention b

information ,trend attack seldom ,range counter, measure..

- policing : police organisation assesment.area indet oversigy internal affairs. Inspector, etch..
- training strategy: following assesment infractions capacity devtbtrainingb,
- development police caoabiyover time , level reinforced all levels trainer station basic police,planning and coordination,
- crime prevention survey b
- traffic management and enforcement, start at the top of Colum the high speed recorded number most equal percent ,speed studies are conducted to determine properly road statistics the maximy minimum safe driving bsoeed ,posted revision ,traffic control that device need safe approach dangerous potential cause number accident cause requirements studies military police determine compliance program enforcement program determine appropriate time traffic signal ,speed limits speed delay route ,vehicle volume studies.
.. traffic enforcement law regulation is an impoy law public safety activity compliance traffic low motoring measure alone device restrictions safety enforcement matter program conducting collision enforcement .routinely employees bvehicle collision borevent injury operationel bmature enforcement bsafet commander overall police military mission population maitainn,target traffic enforcement simple-minded,police procedural check point , logisty support safety transport ..
Search methodeb

..

...

- search methods : variety of search method can employees at criminal search incidence site the specific method used process methodebsite security
- mussi of judge advocate band support legal personal professional blegaj judgement advocate administration of military bapoeaj non judiciary punishment action court martial finding sentence prepare record ,viticm witness assistant program and supervisiin , performance militaire justice,trial defense service exercise supervisor control and director of defence judge advocate assigned United hearing representative soldier , judiciary courts promulgated rules large ,,

- cybercrime : cybercrime are offence targeting or using information technology include computer networking band author telecommunication internet chat room email ,board and group ,mobile phone security financial health can facilitator bvariety activities bmoney laundry . Include racketeering, gambling smsggling trafficking.
- criminals exploit the speed convenience and anonymity modern technologies boffer , commited criminals activities is committed cybercrime individual or smdlk group crime include intrusion ,hacking ,attacks malicious bsoftwars and account takeover kradingbdatabreaxh effecting evry sector advanced in computer technology btelecommunicsftuub, information internet create a virtual market for transanationaj cyber criminals to short stolen information criminals, increase levej collaboration.compagnit topics interest criminals, malicious software , spamming device ,personal identification information, brokerage account information, counterfeit identification,other form contrebsnd ,national security bpritection intelligence industrial bbase relate offence ,computer crime involve computer networking btarget bused commissioner crime damage intellectuel property..
- money laundering: criminal organisation conduct money laude activities to transfer fund into the letimrate , international financial system b,legal restriction blevied by government authorities authority does not have, program make pupolsce variouse information attack computer warfare ,terrorism ..
...

- *
overview
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*__1.*__4.1.2.21.__overview: assessessment, specific of studies are required for various professional field find out more tthese award in the char__t.

Award|certificate| undergrads|diplo|deg Overview: labour framework qualicafition implementation: .
Reliable electrician service ,
Commercial electrician
- wath qualifications do equivalence and comparability national and international , RSA, requirements first need pass all three or admni faill all tree NQF level national ,1,2,3 skills ,10142-1 department dol recognise ,n19 doctoral degree ,N5,6,7,8,9; to,,
Electrical work installation 220 volts ,380 volt ,,

Electricians need to obtain a wireman license ,,valuable certificate , testing and inspection of electrician ,, ewsets ,, eco
Sans 10142-1 national ,pratical requirements by law register , electrical for single phase , installation ,master electrician ..

_____

*__1.4.1.2.21.overview: assessessment, specific of studies are required for various professional field find out more tthese award in the char__t.

Award|certificate| undergrads|diplo|deg 4.Overview qualifications subject and comparability subject close
In Europe Engineering ,UK French Belgium. , RSA ,dr Congo..
-
- qualicafition level 10to level 4:studies .
- introduction :
- qualicafition.
- overall objective for the qualicafition.:
- Pre entry .
- rules of combination :
-Age restrictions :
-opportunity
_ centre requirements :
- assessor:
- internal quality Assurance .
Workplace, assessment ,expert witness ,
Use language is..
- defence awarding organisation is an awarding organisation understand the specific challenges ,facing .
Employees in master trade class.

- asssessment location:
Definition temperature:
Select power rating of electrical appliance to achieve a set temperature.
- carry out electrical energy calculation .
- convert mechanical energy to electrical energy.
- determine the amount of energy consy by a typical installation in terms of kWh .
- determine the cost of electricity used buy installation :

- domestic installation ,apply basic magnet theoryu ,
- explain theorey magnet field for permanent magnetic .
- determine the magnet flux and flux for magnet .
- determine the magnetic flux and flux density ..
- interactt beten perment magnetic,
- characteristics for lines magnety flux ,line , AC of flux
- explat the principles of and electromagnet , magnetic motive force ,create the magnety strength magnetic..

- determine the magnet field strength of a magnetic field strength of magnetic circuit .

- explain the relate between flux. Density magnety field .
- explain term reluctance of magnet circuit..
- 7.6 explain the term reluctance magnetic , magnetic, determine the force ,expericed by current situat with with situation .

- in interactive between current carrying conductor due to their magnetic field ,
- his electro magnets are formed ..
- direction : coils ,solenoids ,direction and Maxwell corkscrew flow ,
- calcul values ,non magnetic materials ,relative and , permeability,calcult value flux ,flux density density field strength ,calculate of flux flux .. Performance.
- using physic properties of the material . permeability length .
- circuit parameter..m.m.f
- calcu value ,motor action Fleming left hand ,
- explain electromagnetic ,explain theory of induced electro motive force ,due to a conductor moving through moving a magnetic field .. Explain the theory of electromagnetic induction to dynamiy inducty calcuk value .em.f produced..
- explain rise fakk current and voly switching and inductive circuit , determination the energy store with ,magnetic field::

- calculate value of induced EMF du flux density length and velocity of conductor,direction of induced ,EMF from Fleming and Lenz ..law
- flux cutting ,self inductance ,rate of change current ,mutual inductance,transformer action ,
- include growth and decay curves ,time constant ,explain capacitor ,descript part part make basic capacitor:
Descry the parts make basic capacit ,describ the construct of different type of basic ,capacitor.
- explain capacitances, explain capacitances,explain dielectric breatand voltage gradient and the importy of these value .
- determine the value of capacitance and charge .
- explain the action of charging and dischary of a capacitor .

- determine the value of charging ,explain energy charging ,determine energy stored inn a charged capacitor .
- in application of capacitors :
Voltage applit charge , series connected capacitors , parallel connected capacity.
- combination of series oarallelleb: 1/c+2/c,, c2+c2,, E=W,, Q,CV
,,- time constant , instrument .
- describe the principles used for instrument ,

- explain how to extend the range of ammeter and voltmeter.
Function of ohmmeter and how it ..
- explain how dynammoter instrument is connected to measure power in a circuit.
- explain the princy of a wheastoy bridge to determine the resistance of a circuit components.
- demonsty how select the correct instrumy loading errors, accuracy and sensitivity..
- digital ,anologh ,shunt ,multipliers,calculate resistant, wattmeter connecty ,
- balancui action actt ,used in field , used the field ,,
- multimeter , state type electricians to Cary out testing , clamp meter ,continii tester , insulation, resistance ,earth look ,impedance testers , short circuit current current meast.
- R.C.D testers ,earth electrode tester ,phase rotation meter ,multi functy ,installer ,
- apply direct current ,DC circuit theory to complex circuit . arrangements..
- state Kirchoff laws , determine the current flow around a complex ,series / parallel circuit combinaty using Kirchoff law.
- calculate the voltage multiple loads connected to wire - wire distribution system .
- apply circuit theories to rotating machine to detert load and starting current ,
- determine the current flow need determine the current flow need in coil to produce.
- the required flux in an air grap of magnety circuit .
- voltage ,current ,power loss in the cable ,voltage,voltage drop in the cable ,ring main ,radial main ,
- DC generator,DC motors ,,
Overview
- *2AC current
- explain principle association .
- define alternating Current
-;determine the value for sinusoidal value.
- shoe how sinusoidal quantite can presented by phasor diagram.
- compare difference with DC advantage ., frequency,periodic time,forms,average value,maximum peak value ,instanouy,value instaneously, additional of phasors , out of phase ,quantities,in-phase of
- explain singly and three ,phase system .
- comparison ,system ,describe type of three phase.
 Between single ,voltage ,number if line conductor, delta connet,start Conny,calcul line and phase value delta star calculate ,
- explain the effect of applying a.c to purely resistive components.
- explain effect for applying AC to purely inductive components.
- explain the effects for applying .
- AC to purely ,capacity ,

- define term ,AC series circuit ,
- determine the value of impedance current phase angle for a series connected .
- define term for series circuit .
Include .
- phase displaced,phasor diagram current voltage , phase angle, impedance, capacitor,reactat,resistance ,A- factor ,resonance , frequency,circuit ,voltage across each ,delay start,
- explain power quantities ,
-;describe the reaction of a purely inductive load connected to an AC supply .
- carry out calculations for single - phase series AC circuit .
- carry out calculations .
- three phase start ,delta connected load ,
- explain the effects of having poor power factor ..
- describ the ways in which a poor power factor lagging can improved..
- determine the size of capacity need to connected to single phase circuit to correct factor.
- calculate the size of a three phase capacitor bank that is need to correct the overall lagging power factor in ,,apparent power,reactive power ,true power ,
- penalties ,cable size , equipment size ,current demand , running of inducty ,motor on full load , synchronous motor,static capacitor,,
- values below unity ,unity ,delta configuy,start configuy,values below unity , unity ,explain the princiy and theory of transformer,
- state principle and operation of transformer .
Describe the type of single phase and three phase transformation..
- describe the construct of transformer,define terms for single phase transformation.
- determine value values for single phase transformer.
- describ losses asociaty with transformser.
,,- determination efficiency of single transformers .
- determiner efficiency .
- state the turns ratios and voltage ratios for three phase transformer,using phasor diagrams.
- shoe to determine the losses of a transformer,in AC ,on AC,on DC,mutual inductance, could ,auto transformer,double sound,core configuy,types,air breather,bucholz ,relay ,consdvator,cool,core laminations,winding ,(HV/LV,,)
- secondary term ,primary term ,voltage ,current ration,turn ratio ,EMF ,equation .
- emergency stop button,earning and cautions ,hazardous,area and correct ,earthing point ,all control panel item ,carry out, theoretical non service ,generator set
- state installation procedy.,
- state installation procedure,consider all safety Pret applicable generator s _ carry out theoretical siting of non service .

- define ground conditions .
- state vdntily requirements.
- define noise pollution,
- define radio frequency RF hazard .
- state tactical requirements.
- define refuelling access requirements.
- ensuring : commission the set ,prepare ,insulayand continuity test ,plant proving test ,fuel .supply is correctly installed .

Correctly .
-the set are correctly earthed ,3 carry out electrical connection of non connection generator non service..
- connection from non service generator set to LV switchgear equipmy .
- checks to include ,check load cable and interconnecting cables .
- check the earthing system .operate non service. Generator set in .
- apply all safety Pret application ,parts checked to include ,engine part ,single mode non service generator set .
- identify the generator part covered during pre start ,check
- Pre start check non service generator set accord according manufacture .
- instruction ,,.
- operator .non service generator set in accordat with relevant technical publications.
- apply load in accordat with safe working practice .
- check adjust generator sets while running .
- maintain a steady frequently and voltage wheb given variouse load conditt .
-take off load in accordance with safe working practice .
- shut down generator .
- carry out after use check in accordat with manufacture .
,- completed used document fuel system , air cooking state care nainteny principle
- apply all safety precat applicable to non service non generator , eayipmy, know to carry eqyipmy , components replace ,wiring system ,record install non service distribuy system ,
- install distribute cabled ,install distribute,unit ,fedeer pillar, MCB,RCD,,
-Occupation Engineering assesment ..
- title : install operate and test ligthning and power distry system ..LAPS..
Outcome bcriteris
- install ligthning power distry.
- state the design function of lapds.
- state the sequence of operationel LAPD.
- state safety preacsyof lapds.
State earthing requirements of lapds ,application .
Inspects lapds ..
AC ,source of supply ,shoe sample ,AC state warniton usage ,introyto safety ,
- potential hazard , requirements to earthing point , protection conductor

earth ,variable residual ,RCD ,generator, large locak distribuy unit , application ,use in service test meter ,Cary out test ,inspect all supply cables and equipment, assist variable
- commissioning lapds ,completed commissioning
...

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- *.***4.1.2.22*** Overview: electrical engineering
mil std- 12850,,FSC. 5920- fuses, fuse holder .. ligthning arresters,electrostt discharge,and telephone protector:
Key : scope : requirements commercial militaire electronics device mandatory applied 4 and 5 herein conflic between hapendix ..
- applicable documents:
-General requirements:
- functional marking .
- terminal identification : when specified in the acquisition documents ,lighting arresters ,and telephone protector shall be identified as their function ,line ,load , instrument ,indicator ground ,using numerals ,alphabeity .
- other functionalite marking : electrical circuit diagram ,cautionary marking ,alignt marks assembly ,instructy ,and marking and symbols shall be specific in the acquisition documents.
-part identification marking .
- method marking : unless otherwise specified in the acquisition docuy ,marking of fuses ,fuse holders , ligthning arresters, electrostatic discharge,and telephone protector shall methods where size limitation not ..
- identify number ,
- manufacture source code ,name or trademarks.
- current rating when applicable.
- voltage rating when applicable.
- data code when applicable.
- date code when applicable .
- other ratings and marking when applicable b..
Methods color coding , telephone ,DC ..

#FSC 5925- CIRCUIT breakers : ,scope, applicable ,function ms marking .. Main terminal ,,shall be marked
- other functionalite marking .part identification marking , circuit breakers ,

_____
Fsc5930 ,switched .scopere ,

Applicable general ,function marking ,polarity switch only positive adjacent to the positive terminal of a polarizing metallic or bimetallic thermostat switch
- rotary switch , rotary switch terminaj ..
- toggle switch : marked in accordance raised depressed number when specify ..
- termination identification,:
Snape action and push switch ..Compton ,com ,normally open ,or no normally closed
-_____
FSC 5935 - connectors ,: scope ,, marking methods

- FSC 5945 relays : scope ,, terminal
- mil - STD ,- 13231
* Specifi item identifict: basis ,contract ,number ,date code
- use of unit pack / bag and tag : verify procuring activities ,mil STD ,#29
- ref ,gov,
- d'etat requirements, electron tube ,, socket ..

- electrical / electronic part and printed wiring board : electrical / electronics part and printed board ,
- nameplate data for article of equipment : article of e shall be marked nameolay data , confirming to mil ,STD 139;.. otherwise specified herein ..
- intended uses,dodos ,marking shipmy,serial ,air transport iteb ,a reprocurement , permancy and legibility test ,subject term ,key ..

- example of gage code ,drawing no ,design activities relationship, originally specified,,
Design activtie,,us army tank automotive command warrentv,size ,cage code #9207,
- name plate data for article ,equipment required for marking container ,indetificatiin set equipment.
- special marking on arcticleb,marking
- high voltage notice ,
- radioacty material ,
-;uonizing radiaty ,
- technicJ literature cauty notice .
-; schematic ,wiring and cable diagram,
- chassis identification.
- modificay work - order number .
- sensitive electronics devices.
- locatt of markiy.
- general .
- type number and type designed.
- marking process
- marking wood

- branding
- size and form characteristics
- labels
- board
- material and process
- corners
- soectraj gloss
- - permancy and durability.
- facsimile.
- workmanship.
..__________&&
- scope , goverment documents b, drawing b,
- assemblies ,
Commercial Nd government entity gage , commercial off shelf
cots ,container ,decLcomanua,design activiy, functionalite marking - joint electronics type design system,manufactute ,supply,order precedence ,part pin identify ,item draw , sequence b, general , nomenclature design ,
- identify number .
- procurement identify number
-
_____&&&&&&
- introduction to systems e manage.

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- introduction : system engineering fundamental
system engineering management.
- system engineering management did acquisition.
-the system engineering process.
- system engineering process overview
- requirements analyse:
- functional analysis
- design synthesis
-verification.
- system engi proi output.
* System analysis and Contry :
- work breakdown structure.
- configuy managey.
- technical review and audit
- trade studies

- modelling and simulation.
- metrics
- risk management.
* Planning organising and managing:
- system engineering plannt,
- product improvement stratei.
- organisation and integrating system devely..
_____&&___&_____&
- facility ground system
- general:
Application , definition, ref
- description:
- facility ground system.
- grounding and power distribution system.
-;electrical noise in community systeme.
- bonding shield Nd grounding relationship.
- ground safety practices .
- earthing Nd electrode subsystem.
- object : ligthning dischary,fault protection noise ,resistance,ligthi requirements.soul resistivity ,general
- measurements of soil resistivity
Measure technique ,one electrode , general ,ground ,buried horizontal, grid ,plated ,metal framework of buildings..,,
- measure resistance earth ..
Lighting protection systt
_____&&&&&
- design synthesis:
Design dey: conceybbased functionality creative architecture set product capable. Perfot the requested software Archy developm b..
- output : physical architecture product , elementary decission database.
Input : functy architect.
- enablers : ipts decission ,automated tools ,model
- control : constraint gfd ,got reusable ,SW,system concept ,subsystem .
- activiy : allocate function and constrat to system elements, synthesis system , define physical interface ,define system interface ,develop life cycle technique and procedure , integration system elements b,select preferred concept ,
-_____&&_
- preparing activity. Ref : definition
Submittal ,quality assurance ,
- installation drawing ,
- standard products
- alternative qualifications.
- material and equipment manufacturers data .
- warranty .
- system description:

- system requirements.
- selection criteria.
- products .
- power meters.
,- physical and common requirements.
- voltage requirements.
Current requirements.
- electrical measuremt
An meter display out reading capabily
- installation methods.
- disconnetit switches
 - meter programming .
- communication.
- optical port.

-;serial port.
- ethernet .
- communication photcols and methods .
- communicate channels surge protection .
- meter data protocol ..
- transformer mounted ,xfmr
- meter base shall located outside secondary .pas mounted transform..
--
Stand mounted transfo metering unless the transformer pad is being poured and the instrument conduit can be installed before pour provide a drawing to show detail for mounting and routing conduit and wiring .

- stand - mounted adjacent to transformser the,stand in metering system schedule.
- meter base shall be mounted on structural steel pole approximately ,feet from the transformer pad see,
- building mounted, bldg in metering system schedule .
- meter base shall be mounted on the of the existing building .nears the service .

___
The folly optional featy will usually be deleted , connect an energy many and control syst.
Meter shsjj include output anslog Chanel 0-# ma, or 4 - 20 ma ,,
Ieec ,c 37.90.2 standard surge withstand , capabilities ,sec test for relay ,system association ,
IEC ,,61000-4-5 electromagnet.. compatibility,EMC test measure technique ,test ,IEC 62053-22:electricity metering equipment.
- static meter for active energy,class 0,2 s and ,0,5;,Ed,1.0
- NEMA ,ansu

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- ***1.4.1.2.22 overview : description**
- history and development:
- secure network programming.
-ssl ,1.0,2.0 and 3.0
TLS 1.0,,TLS 1.1. Draft
- digital certificate .
- algorithm .
- key excht or key agreement.
- cipher.
- data integrity.
- application and adoption .
- website,
Web browser.
- libraries.
- security : SSL.2.0,,SSL..30..
TLS
- attack against TLS / SSL
Renegoty attack.
- dowgrade attack ,freak attack and log attack.

- beast attack .
- crime Nd breach attacks ..
- timing attacks on padding .
- ppoodke attack .
- truncation attack.
Unholy pax attack .
- sweet ,$2 attack .
Impley errirv.hearblrd,bug ..
- CloudFlare bug ..
- survey of website vulnerable to attacks.
- forward secrcy ..
- dealing with man in the middle attacks .
- certify pinnit .
- perspecty project.
- DNS chain
* Protocy details .
- handshake ..
,- basic TLS handshake.
- client authentication TLS hand shake .
- resumed TLS handshy.
- session IdL record .
_____&_____&_&

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-; **1*.4.1.2.24.*overview topics.. info sysy management.**
- introduction.
-backgroung to the study .
- researche aims .
- limitation of study
- researche form , approach.
- summary.
* Information security policies ,standard ,practices .
- introduction.
-;pillars of information security.
- indentificaty authentication.
Authorizay, confident,integrity,non repudiation.
Cybercrime telecom
Compare system, introduction

Abscent bof relevant secondary data financisj ,culture economy.

Reasech b methodology b,technical data collection b, fast approaching b,sampling population probability b,sample size ,testing present application
* Information from business perspective .
Information protection:
- IT security standards.
- iso .
- .other..
* Compliance issues reported on the global territory.
- critical success facty of information security.
- reported case studies and survey results..
- global information security survey research , global..
-;online computer sciet corporate survey.
- lesson learnt from the global find ..
-:comolit issue, introduction ,
Underyvmajorv pillars economic.
- statistics test.
- summai.
- analysis finding.
- overvit of analyse .
- response rates ,response by .
- analyse of information sect practice

- static test
-;investt reason security need to strike balance protecbresourcev,enhat learning n,
- the security infort is of paramount micr coutb..
-;continual upgray and investing in ICT insfracture.security police applied to staff premises electronic infory.
- data processing and stored on line ,information personal hard drivers .
- backe up data ..
- archived data or off line storage Lai ,,audit log

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*__1.*__*4.1.2.25.* __Overview : fundamental of electrical engineering.__

Work license
*** Introduction: signal represent information.**
-analog signals.
-digitsl signals.
- structure of communication system .
- the fundamental signal.
-the sinusoidal.
- communicating information with signal.
- introduction problem.
- * signal and signal :
- complex number,
Definition, Euler's formuler,
- calculating with complex number .

Elemental signal ,sinusy.
- complex exponential.
- real exponential.
- unit strong.
- square way.
- signal decomposition.
- discret time signal .
- real and complex value signals.
-;complex exponential.
- sinusoidal.
- symboy value signal.
- introduction to system .
- cascade interconnection .
- paralleled interconnection .
-simple system
- source x,amplified ,delay,time delay .

- derivative system and integrator system
- linear system .
- time invariant system .
- signal systems problem.
- discovering roots .
- cools exponential s.
- complex value signals .
- linear time invariant systems .
- linear systems
- communication Chanel .
- analog computers.
- analog signal prot:
- voltage current and generic circuit eley.
- ideal circuit elements.
Capacitor,inductor,source ,
- ideal and real world circuit .
-electricL circuit and interconnection Las .

- Kirchoff law .
- power dissipation resistor ..
- series parallel circuit .
- equivalent ,circuit resistor and source
_ circuit with capacitor inductor .
- the impedance concepts:
- time and frequence domain .
- power in the frequency don't .
- equivalent impedance and sourcev.
- transfer functy.
- designing transfer functy .
- formal circuit methods node .
Node
_ nodeb methods ..
- power conservation in circuit.
- electronics
- deoent sources
- opert amplifier
- inverting amplifier
.
,- active filtre.
- intuitive way of solving op -amp circuit.
-analog signal procesy problems.
- simple circuit analysis.
- solving simple circuit.
- equivalent resistance .
- superposition princy.
- current voltt divider .

- thevenin and Mayer Norton equivalent.
- detective work .
- bridge circuit .
The complex plane .cool curves.
- trigonometric identy and complex expontial.
- transfers functt.
- using impedance .
- measure Chas .
- transfer functy ..
- simple circuit ..
- circuit design.
- equivalent circuit and power .
- power transmission
- optimal power transmission.
- circuit detective work .
- mystery circuit.
- more circuit detective.
- linear ,time , invariant.
- long and sleepless.
- a testing circuit .
- black box circuit .
- solving mystery circuit .
- analog hum rejection.
- an interesting circuit .
- simple circuit .
- an interesting and useful circuit .
- circuit problem.
Computer analog .
- transfer funcy and circuit...
-;depend sorcev,, operationel amplifier..
Problem..
- design bandpass.
- Pre emphay or demphadisv.
- active filter .
- this a filter .
- optical receivers .
- reverse engy .
,- solity .
- introduction to frequency domain.
- complex Fourier series.
- class Fourie series
- signak spectrum.
- Fourier series approximately ofsigndj
-;encode information in the frequence in frequency.
- filtering periodic.
- derivation of the Fourier

- linear time invariant .
- transfer funcy.
,- communication transfer funcy.
- modelling the speech signal.
- simple ,Fourier signak .
- phase distort .
- long hot days .
- duality in Fourier.
,- lospass filtering a square wave
- marhemat with circuit.
- arragemy of systt.
- problem.circuit .
- reverberation .
- echoes telephonic.
- effective drug delivery.
- catching soeeder with radar

-demodulating anbam signal .
- unnsuak smolituy modulation.
- Sammy falls asleep
- jamming
- am stereo
- novel am stereo
,- a radical radio idea
- secret community.
- signaj scranbliy.
-* digital signal processing:
- introduy to digital signaj processing .
- introduy to computer organisation.
- computer architecture
- computer and logic
- the sampling theorem
- anslog ,to digitt conversiy
- the sampling theorem .
- discret time signal and systems .
- real and complex valued signals .
- complex exponential.
- sinusoidal.
- unit
- discret time signal .
- discret Fourier.
,- dtf computiinsl complexy.
- fast Fourier .
- spectrograms .
- discret time system

- filtering frequency v.
- digital
- information community .

- type communication Chaney.
- wireline Chanel
- line sugth transmission.
- the ionosphere and communication.
- noise and interfey.
- chznnemoddls
- baseband community.
- modulated communicay.
,- signal to noise ratio anplifiy modulated .
- digital communications
- binary phase keying .
- digit communication in the presence of noise .
- digital communication system properties.
- digital Chanel.,entropy.
- source coding theorem
- compression and ..hufan code
Repertoire.
- repetition code , block channel code ,error coding ,error code
hamming ,error, noisy chNdj code theireb .
,- communication network .
- message routing .
- betwot architecture and interterconnectiin,ethernet.
- communicay protocol.
- information communication .
- solution .
- decibel
- permutation combination ..
*Show that cos (2 π f.b)=cos(2π(f+1)n) mean sinusoidal correspond ,,am radio station frequence ,1 MHz ,,,phase = t= 0 ...
- modulate carrier transmission b, amplitude b signsk ,A=AO(1+KT) ,so ,Nd k constsb ,t parameter ,,
- the RMS values periodic signal definite ,TV is signal ,periods (t)=s(t+T,)..
Wath is the period of 0 ,s(t)= Asin (2πf0t+alph) RNs signsn ..
Modem is short modulator inspected plug AC socket , connected computer line digitsh telephoy connecting discret sinusoidaj presence ,0 or abscencde , consequences modem ..
T the amplitude .
- wath smsljest transmission interval bmake send with frequently f ,o
Assuming that cycle sinusoidal single bits transmit scheme ..value amplitude .
- the classic communication message source ..

,- advanced modern to transmit RU letter ,frequency ,1600 and 2800 Hz and several amplitude

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* 11.overview :
electrical e
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- *1***.4.1.2.25.*****Overview:electrical engineering:**
Introduction electrical engineering is the field of technical application of electricity or the discipline that studies production transport processing used energy,, current high power ,, industrial compagny..close to electronics and automation discipline..
- * key purpose : of teaching electrical engt teach engineering in electronics industrial concept industries compagny close
Years teach studying : study of single phase and tree phase regime ,transformer , and DC synchrone AC current asynchronous machine..
- the single phase regime ..
Writing sinusoidt quantitit written sinusoidal.

1. u= Um.cos(wt+j) strictly instaneously voltage ,u(t)= with v amplitude,w pulsation ,rad,initial phase.
- average value of a periodic quantity.
u>= 1/T.integral.(t) .udt.. for a sinusoidal .sinusoidal signal,< u>= 0.. vs effective value of periodic quantity ..
u=o1/T.integral (t).u2.dt..rms for root means square indicator..
Zu=UO×2 cos (wt+j).
RMS value value is that indicated volt metre and ammeter electrotechnical ..
- vector representation fresnel ,,ox instaneously,, voltage u= UO3.cos (wt+j) vector associated ,Ox ,,AT ,,wt+ j ..UO$.
- u in projection on (Ox,)..
Courent I=io×2cos×(wt+j) draw ..
- complex notation .
The additional substration two quanties same pulsation.
u1=U1×.O2 ×cos×(wt+j#) of u3= U.2.O2 .cos (wt+j2..

- u = U.×O.2cos×(wt+1)
- construction vector ,U= U1+U2..
Derivation / integration of sinusoidal quantity give ,, P/2 integrating means module ,back P/2..
* Power in single - phase regime receiving sign system receive if energy ..
P= u×i×(watt - W) ..
- activzgion average value instaneously value of in the case of ,periodic quanties periodic ..
T: P= <p>=1/T.× integral (T) .pdt(watt ..
In case sinusoidal voltage ,u= UO3× cos (wt)..
I= IO"2.× cos (wt + j)..
P= U×Icosj+U×I.cos (2wt+j)..
Scale ..
P= I×U× cos the active power in single phase ..
- P= U.I ,scalar product ..
S=I.U. Amp..
K= P/S..
12 cos a.cosb= cos (a+b)+(a-b)
- reactive power in sinusoidal regime ..
The reactive power in sinusoidal..
Q=.u× I× sin j reactive ..
- A= 'O' S3-O3..
- tan j= A/P .cos j = P/ s
Sin j = A/s vectorially ..
- A= U. I

J= P /2 ....
---
*Joule loss in electrical network high compared to active power ..
.
Bouchero theireb apparent ..
P= SK..Ok..A= SK.Aks..
Complex power..
P=U.I= P+jA..

- introducy : characters of electrical distt netwot the production energy three phase forb ..
- power On,single phase ..d.d phase ..
- calculation of joule losses in the single phase line .
Loss = 2× R×I$ with ,I = P/ U cos j and R resistance of line ..
Loss single phase = 2 Rd P 2/ s .U.2 cos .2 calculation joule losses ..
Poster line = 3.R.12 ,,I= P / O.3 u cosj ..
Poster = Ro2/ U2cos 2 j , with ,R= r.d / s ,,
Advantage three phase Lind for distribution , joule losses inversely proportional to share of the voltage to the line length t,using high voltage ,transport energy over over long distances..lond

distance ..transmisst (that ,,high volty) 400v..and 225 kV ,, intermediate network ,, 90 and 45 kV ,,MV 20kv ,220v v between phase ..
- network frequency ,69hz , acceptable ,40hz ,,
- store reactive decreased voltage distance thtb also interconny , indicate products was 78,5:,plant ,nuclear power plants
- study balanced three phase systems ..
- system form implies that they have the same pulse .
- system former said ,1,2,3 second is lagged by 2p/ 3 , 4 P/3 distribution of energy electrical netwt is done ..
V1= V'O'2×.cos.×(wt)
V2=V'O'2×. cos× (wt-2p/3)
V3=V'O'2.×cos×(wt-4p/3)
* The associaty ,wt ,(rad) v(v) .vo2- v1.v2.v3.
Sum three sinusoidt form ..
Quantity system is zero ..
We check ,,V2+V2+V3=O fresnej rotation cubical ..
a= ej2p,/3= cos(2p/3)++ j.sin(2p/3)=-1/2+j.'0'/3..
2p/3 advance..
V2=a2V1 and V3= aV1. Result is express ,#+a+ a2 = on,,V1,v2 and V3 ..
- cos (wt) + cos(wt-2p/3)+cos(wt-4p/3)=0..
V#.v2.v3
I3.U1=V3-v2
U2=v1-v3
I3=v2-v2..
...

U1=U'O'cos(wt+P/2)
U2=U'O'cos(wt-p/6)
I3=U'O' cos (wt+7o/6)
U=2v.cos (P/6)=V'O'3..

u1+U2+u3=o..
- wt ..-
Engineering electrical..
Impedance..V1=Z.I1
V2=Z.I12,,,V3=Z.13
Lead ,,V= Z.I ..
- jk = UK/ Z5k = @,2,3 ..
Law of node ik= - j'0'jk
I1=j2-j3
i1=j3-j2
i3=j1-j2..
Ok= 3vk/z=vk/(z/3)..
..u1+U2+u3=o..

J1,j2,j3..
J1+j2+j3=0....
- equivalent: balance and symmetrical tree phase network sinusoidal regime line impedance vs power in three phase relating ..
Instaneously:

P=p1+p2+P3
P=v1.i2+v2.i2+v33.i3

V1= V'O'2× cos (wt).i1=I'O'.cos (wt+j)
V2= V'O'2 cos(wt-2p/3)i2=IO2.cos(wt-2p/3+j)..
V3=VO.cos(wt-4p/3)i2= I'O'.cos(wt-4p/3+j)
-p1= V×.I×[cosj+cos(2wt+j)]
P2=V×.I×[cosj+cos(2wt+j4p/3))
P3= V×.i×[cosj+cos[2wt+j-8p/3))
- active power..
Cos (2wt+j)+cos (2wt+j-4p/3)+cos(2wt,+j-80/3)=0..
P=P=3.V.I cos j ..
Measure rotating power outage constant torque ,
P=3.v.i cos j = "0" $.U.I cos n ..
Q= 3.v.i sinj ..
S= 'o'O2+A#..
,,indicator by watmetter,,w1,w2,w3,,

Assembly is valid
W1=< v1.i2>,,,w2= v#.i2...w 3= v3.i3..
W1+w2+w3,,=< v1.1+ v2.i2+ v3i3=

--
**Single ,- phase transformer .. presentation magnet field excitation vector denoted H create a vacuum by any moving electric charge or by a perment magnet.equation ,Amper verification by H: rot H= j
Ampere theorem , relation Stokes
-Integral contour (c).A.dl= integral .integral rot A.ds
Ampere theorem ..
Integral contour .C H DL = integral .integral .sj .D's ..
- B= u.h permeability magnetic include ,uo= 4 p.20-#0-7 ,,
B=u0H+j..
H=B/uo..
M= cm .h
B=uOH+u0cm=up(1+cm)h=your..h=uh..
- application ,ampere ..
Countiurn .(C).h.dl= integral .integral.ds=NI=HL..
Silence solenation..silence ,= N.I..
Relictat denote magnetomotivd ..
A= reluctance / AE= integral integral s .B.ds..sectionn..

Hopkinson law ..
Reluctance = S+ NI= A.A Ev..
Application saturated ferromagt hysteresis characterise curie temperature ,air gaps
Ni= (L - e)B/u+eB/uO=[B/u0)(L-e)/ur+e,,,,magnetic ferromagnetic bcristajj iron cobalt nickel ,,
Scale ..
- H=0 phenomenon..
Iron = v.at ..
u+ e=r.i bucheri ..
Kapps hypothest ,u = Ndj/ St from ,u= e..
- Ndj/ St ..
= J = (U'0'2/ NW).cos (wt- P/2)
= AE.m cos (wt- P/2)
Sinusoidal quadrati backwards ..
Voltage..
U=4,44 N× f× AE.m current consumption ,,j = B's ..
HL = nU..
R= O / I 3 and L 2 w 2 = (U/U) , #- R # or RO = (R2+L 2 w 2) / R ,L ow (R2+ L2 w 2:/ L w..
..
Hopkinson ..infinite permeability ,A= O and the windings resistance (r#= R2= 0)..
N1.i1+ N2.2= AJ= 0..
e1= r2.i1 with r1= 0,,
U1=-e1= N1.dj/dt..
-u2+e2= r2.i2..r2=o
U2=e2=-N2.dj/DT,accord ..i2/i#=-N2/N2=-m..m = n2/N1 transfo ration.

U2/U2=N2/N2=m U1/I1= N2/N2=1/m..mmore less 1 step up up step down ..
Perfect transfo winding input impedance b..
U2= Z2.I2..
U1= Z2/m..
Z1=Z2/M2..
U2+e1=r1.i1
e1=- dj1/St.j1..
J1= N1.jc+jf1

Hence = u1= r1.i1-e1
U1= r1i1+dj1/St=r1.i1+N1.djc/DT+djf2/dr..
- U1=U1+r1.i2+i1.d1/DT..
U2=n2.dc/DT
-u2+e2..
M.u1+U2+(R2+m2.r1).(I2+(i2+m2.i1).di2/DT=0..
RP=r1+R2/M2..

IP= i2+i#/m ..
Supplies..
The loss ,U2=o,=p2=o..

P1cc=pj1cc+pfer+pj2cc
Test loss joule..
Zs= M2.u2cc/ i1cc..
du3= u20-u3..
m.u#= Rs i2+ jlsw.i2+ U2.Rolo..

H= p2/P2..
P2 active power measure ,
.

.
...

1*.4.1.2.26.*Electrical engineering : courses
- maximum rectification ,number turn offset ..
,uAB .
Proportional. Speed of rotation the rotor and flux created under eawch pole ,E=× KA×E.>
As total flux per pole ,WB ,,w the speed of rotation ,rad ,,k proporty coeffiy , depending the structure ..voltage generator,to speed ..
Mechanical energy received into electrical energy we couple electromagnetic..
Power = Pen = Pmec = elect
P meca = Gem.
For generator ..PEM < 0 resistive torque ..
..U(V),,I(A),,EV,,Ev ,,w
U= EV (Ie)-h(I),,
Speed characteristic ,over current = ..
- Gem = KAEI..
W= (U-RI)/KEI=(U-KAEA)
- Gem = KAE.(U-KAEW)/R..
- Go lost ,Gem = Gu+Go..
- Pa = UI+Us.Ie
PJ= RI2+r.Ie

EI= Gem ..Pu = Gub..
Ie=I..
U=E+Rtot,,,radii

---ac machine : this present operationel principle and the main characteristics of the .three phase synchronous and asynchronous machine ..
- creation rotatt.magnetics field constant modulus rotation in space speed w , theorem LeBlanc ,,a coil Ox axis traversed by a current ,I(t)= I 2 cos (wt) ..create magnetic existation field on m× H.H ..t.t.r.r= cos (w) ..in vector forj ..H.H cos (t) ..m = w in complex form ..
I(t) × H
..H++H= H supplied by current (t) = #2 cos (wt) .. synchrone machine is reversible ..
- Asynchy machine ,,principle of operatu the operationel synchrone machine .. resistance R inductance ,L the rotor ,,rotatt speed ws , the plane of the field ..i1(t),,i3(t),,i2(t),,s,w,B,w
The rotor being initial coil sees variable flow crossing ,F= integral.integraj .. B.ds.×S=an...no longer variable flux therefore longerf..note q(t) the between s ..
t.t Sq()= (w-w)
.tnBs[t].s ..
F= Fe.(Ws-S)..(t)..(DT)..
=F=-Fs-ww-wjt.ms = jF(w-w)e(ws-w)....
I(t)=I'm cos [(wa-s)t+j]>>
- m= n×i×(t)×s..
Gem coil ..
mB.mBsin(t)×i(t).sin(t)..em G= q=F.q
-m.B.msin(t)×i(t)×em ,,G= q= F× q ..I cos((t)) sin (f).em.mm.G = F.w+ja ..sin (2a())sin .....
- average value electromagnetic torque ,applied to the coil ,rotor ,w (rad,s-1) was ,,es - R/Lb..

Asynchronous motor ..
dF.r= Id× L × r × U ..iroon .
Magnetic , hysteresis thermal ,next ..
P= Cm× m,,da.dp = w .DW ,,DCM + cm
= O= w.dcm + m =0..

_____&&&&&&&&&&
Technologies ,electrotechnology..
- distribution energies ,source autonomouse ,
- ..Scheiner and Leroy equipment..

*__1.4.1.2.27.Overview: drawing instruments and accessories: Introduction ,roles of engineering drawing ,drawing instruments, drawing board ,mini draugther , instrument box ,set of scale ,Fr__ench curves ,drawing sheet ,title block , drawing sheet , folding of drawing,lettering , important ,single stroke ,type of single stroke letter ,lettering practice , identification shapes , arrangements , introduction ,reducing ,enlarging scale , representative fraction ,types of scales ,plan scale ,vernier scKe ,,
* Geometrical construction : introduction ,conic sections,circle ,ellipse , parabolic , hyperbole,conic sections as loci ,movie point ,special curve cycloid ,epi cycloid and hypo cycloid .
* Orthographic projection : type of projection ,method of obtaining ,method of obtaining top view ,fits angle projection ,third angle projection projection
* Projection of solids ,introducty ,polyhedra ,regular of polyhedra ,pyrat,zolide of revolution ,frustum of trucTed ,, pyramid ,cone and ,selection view ,three view ..
-* development of surface : introducty ,methods development , development bof prism , development of cylinder , development , base come ,
- * isometric project : introduction ,principle of isometric project , line in isometric projection,isometric projection , non isometric line , methods of constructing isometric , box method ,isometric projection plans ,isometric projection prism ., isometric projection of cylinder, isometric project of pyramid, isometric of cone , isometric b.
* Oblique and perspective: introducty,oblique project , classification of oblique,methoy choice , angle circle and curve ,perspey , nomenclature ,
* Conversion of isometric view to othogray ,selection view ..
* Section of solids : sectioning of solid ,introducty ,types of section view ,cutting plant..
* Computer aided design ,drawing cad : introducty ,history cad ,advantagevcad ,auto cad main ,starting a new drawing , opening an existing drawing ,setting drawing ..
- set scKes sale one edge 1:2, 1:2,5. , 1:2,5 ,,1:200 ,,,
Reduction scale ,,50:1:120:110:1:512:2...
-3H, 2H,H..

Draw sheet size

-.Perspective projection : .
Nomenclature of perspective projection:
- ground ,GP ..this is the plane on which the object is assumed to be placed.
- station ground plan (A.G.p) : this any plane parallel to ground plane ,not showx
- picture plane ,,P.P this the transparent vertical plane position in between the section point and object to be view perspet view is forme on this plane .
- ground line GK this line interesting the ground plane .

- auxiliary ground line ,AGL this line of interesting of the picture plane auxt ground ..
- horizony HP this imaginai horizontal plane perpy to the picture plane and passing through the stationary .line levels .
- horizon line ,H.L this is line intersection of plane picture plane is parallel ground line ..

Axis vision .A.v line drawn perpendicular to picture plane and passing through station the of vision calkedv..sight or perpendicular axis .
- centre vision CV is the through with axis of pierces .
- central plane .this imaginary plane oerpeny ..

-; **1*.4.1.2.28.*Overview: civil engineering as discipline Education**
- civil engineering as discipline ,civil engineering is professional,civil engineering is Education ,
Educat , practicing engineering:
- sub discipline.
- coastal engineering,
- constructy eny
- earthquake eny.
- environment engineering.
- environment engineering
- forensic engineering
- geotechnical engineering
- materials science and e.
- surveyiy.
- transportation eny.
- municipal our urban Engineering.
- water resource engineering ....

_____&
- *size and scale ,,standard view in architecture drawing :
- floor plan .
- site plan
- elevat .
- cross section .
- isometric and axinometric projection.
- detail drawings.
- architecture perspective .
- presentation drawing .
- survey drawing.
- record drawing.

Working building
Building information ..

- ,architecture draw

_____

* History of construction surveyinf .
- elements of the constructy survey .
- coirdinay system used in construct .
- chainage or station .
- building grids .
- other coordinator system..
- equipment and technique used constructy in constructy.
- equipment and technique used in mining tunneling .
Understanding ,distinction from land survey..

*__1.4.1.2.29.overview council :Engineering : engineering is discipline ,skill and profest of acquiring and Apr scientify economic social pratical knowledge in order to design and build structure ,machine ,device ,system , material process.__
__- American Engineering council professional de__velopment (ecpd the predecessor of abet .
- the creative application principle design development structure ,charter engineering incorporated eny.
*,key history : ancient era ,reinenssance era ,moder era ..
- main branches of engineering.
- methodology.
- problem solving.
- computer use ..science medicine art
. Engineering has exist since ancient times as humain divided fundamental invention such as the pulley ,lever and wheel ,each of the invention is consistent with modern definition of engineering exploiting basic mechanical principle to develop useful tools object .
- term eny itself much morent etymology derive word engineered back 1325 wheb who operated original constructor militat engines militaire machine mechanical bcontraption catapult ,notable obsiletb militaire Coro ent ,Latin ingenium ,1250 means innate quality especially mental power hence lever invention,later discipline ,,
-Ancient era the Pharos of Alexandra the pyramids in Egypt the hagind gardens Babylon the Acropolis and Parthenon Greece ,Roman appliav,empire great India among other stand as testament to ingenium and skill the ancient civil military...
Ancient develop machine in both civilab militaire domain mechanical invention archimt Antikythera mechanism requirements sophisticated

knowledge of differential gearing theory help ..
Ballistic catapult nidlke chine .
- renaissance era : first electrical engineering is considered to William Gilbert with who coined teen ,steab build thomers ..
- modern era : electrical engineering can trace it's origin experiemental of Alessandro Volta in the 1800s ,the experiemental of Michal Faraday ,Geir ohm other invention 1872 the work of Ames Maxwell and Heinrich Hertz in the 19 the century gave rise to field electronics later of inventi vacuum tube transistor future the later invention development of electronics extent electrical and electronics ..
- the inventt of Thomas slavery and scotissh ent James watt gave rise to modern mechanucsj to develop maintence tools ..
Aeronat engineering ,pioner sir Cayley recently b..
- main branches of engineering : eny science broken down into several sub discipline bconcern area engineering initially engineering usually multidist ..
Chemical engineering : the application of physic ,chemical ,bioloy and Engineering principle in order to carry out chemical process on commercial sales.
- civil engineering : the design and const of public and private work such infrastructure airport roads, railway,water supply and treatment,bridges Dan's buildt .
- electrical engineering : the design and study of variouse electrical and electronics system ,such as Electrical circuit ,generator ,motor , electromagnetic, electromechanical device ,electronics ,optic fibres ,optoelectronic devices ,computer system , telecommunication, instrument ,control and electronics ..
- mechanic engineering : the design of physical or mechanical systems .such energy systems aerospace , weapons systems , transportation product engines ,compressor ,powertrain chain kinematics b, vacuum technology n.

*__***1*.*4.1.2.30*.Overview: research Framework qualicafition saqa,**__

__-* key :qualifications title__
__postgraduate diploma in educational technology qualicafition..__
__Council on high Education v.__
Post graduate:
- field : field 05 Education training , training and development ,wiring skill ,

- purpose and rational the of the qualifications : qualicafition brules :
Module : emerging technologies Education .
Reseda and evaluation of emerging technologies .
- online learning design learning ,teaching and .

Emerging technologies ,
- digital design for mind brain and Education ..
- ICT and society context policies and pratice ,
- research method and ICT
- teach and learning with ict

learner may articulate horizontal to a
Bachelor of education honours,bachelor of education honours technoy education , postgraduate diploma technologie..
- learner may articulate vertically to either of following : master of Education technology educat ..
- master of Education technology education science ,,saqa board decission .note skill development .

- national certificate autotronics ..
Primary delegates quality assurance functionary ..merseta manufacture engineering and related service education ,
- OWS , occupation qualicafition sub framework..
- qualicafition b.manufacturing Engineering and technology ,interpret read and produce electrical working drawings..
Subfiej manufacturing and assembly b,
- Abet band , minimum ,Pre 2009 ,NQF level qualifuc
- qualicafition title ,levej NQF 03 ,,141 ,, completed
- install electric wire ways ..install electric wire ways ; electrical engineering , construction ..
- field : physical planing and construction , electrical insfracture construction ..
Install wire us standard ,Pre levej , NQF cred replacement completed ..n engineering studies department Education
National n certificate ,field 06; manufacturing engy and technology , categories .trade theory instruct offering ..sets training authority sets training..trade theory categories a
, mathematics categoriebb,science categories ,a drawing ..

- n diploma engineering nated

Education computer

_____

- **1*.4.1.2.31.* overview ,: velsoft course .. workplace safety ,sale Sale ,leader ,process management, problem management,problem business planning, meeting ,human resources v,talent essentidj ,customer ,conflict resolution b, negotiation**

skills ,supervisor manager ,communication ,team building marketing, finance writing
Writing ..
-* session introduced ..
- planning training : and prepare are to develop the tradiniy prepare employees examine the step through ..
- designing a learning sequence, adding game ,continue presentation..dealing with difficult training : on job instruction training training is becoming more and more prevalent this session .
- training presentation.
- evsluay.
- workshop wrao- upn..
,Pre - assignment ..
..- we learn do by doing ..flip chart tipf ,,: ,,
- enviry considery: money ,time
- use measurements term .
- on the job traini process ,creat visuay : be generi with ..
- writing learning objectives v

-**1*.4.1.2.32* overview researche, qualifications occupation ,criterion master and honour graduate diploma ,,**
Research field: skill and
Practice opportunity writing student ,,teacher decrease .

-* key prepare criteria selected asssessment test : whether it is a cognitive abilities exam ,skill test or personality assessment job test prei discover .
Aptitude ,skill personality .. candidate ability solve problem universal cognitive ,measure digest and apply information
Testb9-12 minute candidate ..
,- criteria skills test ,measure skill for entry level position or position that requires test determine . 29 minute ,40 questions assess mathematics ,langi grammar general spelling , .
- typing test : one minute test typing accurate .
Ten key test for data ..
-;excel test 20 item item that measure proficient in Microsoft completed 20 minute .
Measure ms word ,power point ..
- computer literacy and internet knowledge test click 10 minute test consisting of task that are following by multiple choice .tasks take three ..
- criteria personal test .. personality test used to reveal ..
- licenced electrician assesment everything you .
NECA ,licensed electrician assessment.

.
Grade set exam before being award their license passing the assessessment hold means that ..supervisor ,final stepping stone .becoming fully qualified e..
-assessors.
An electrician ,A/E class license for rec technical assessmy.
- An offshore technical skill record .
-an supervisor workers licence l class.
* Electrician safety ,require apprenticeship to four licensed straight away ....
- specialized on exactly..
- educay
2. Week basic license : reading comprehension test ,numerical reasoning test , mechanical reasoning test , spatial reasoning test ..science test , personality ,study money ..
Key
- trade apprenticeship aptitude test .
Test time 10
Question. ...10
Pass score. 80
___elevator industry aptitude test ..
- test time. 5
Question. 10
Pass score. 80

* EIAT test ..

- time. 10
Question. 10
Pass score 80
___&&
Take your apprenticeship assessment with conference..

_____
* Math word ..at pencil 7% all the pencil produced come out cracked if 56 cracked pencil were produced on a give day ,how pencit we produced in total that day
.
,- spatial reasoning problem.
- mechanical reasoning problems.
- how far does the mass rise when the rope is pulled for 6 ..
- all pulley fixed
- mechanical reasoning problems: which following tools used on wood.
- electric circuit : in the circuit below which point will to current the greatest ,point ,a,b same both points ,not possible..
* Apprenticeship assessmttips

* **1*.4.1.2.33.* research apprenticeship assessment tips : interested ,make sure you meet requirements with relevant skill and experience.**
- prepare prior to the screening process .
- keep cool during interviews.
- sell yourself don't worry to much about wath ...
- elevator industry aptitude test ,: the elevator industry aptitude test will test on reading and mechanical comprehensive along with arithmetic compulation when passed this test you will prove ready take ..
- national elevator industry Education program aptitude ,,for management and implementation of circulum design probationary training ,and program evaluation for all apprentice entering trade.
-;iron workers apprenticeship exam practice : from reinforced structural ,and ornament ironwork this test will help you get fully prepared for certification..
-electrician apprenticeship.
- this test dived in two separe section algebra function ,33 questions ,46 minute and reading comprehension ,36 question ,51 minute..
- the advantage of using our preparation material .
- up to date material ,full length simulated test practice test ,practice within the exam time frame ,exclusive access to top study content practice ..
- exclusy access to top study content and pratice ..
- review : 4,9. ..
- apprenticeship assessment .
- who usually become an apprentice , apprentice are usually young people the age of 27 and 25 but the can be of any age .
- how long does apprenticeship last take between one four years .
- how much an zppreny gets paid , apprentice are entitled to minimum rated per hour .
- where do I find about apprenticeship different options ,: to check option visited .
- what are the characteristics of a field that integrates the apprenticeship process : aside from passing the certify test you will also undergo a rigorous of 2000 hours of traini relating to manual mechanical or technical skill and least 144 of hours of classroom theory to boot ,you will find the entire process and structure of the program well structure along with system on site supervisor learning program..completing after fully certified your field ..
- advantage: going apprenticeship : gain skill knowledge working on site become more efficient at your job but will also naturally aid to our when it comes in class test and assignment ..
- the apprentice process : completed registration and application gear up for

full day of interview ,get tank and score ,if pass begin program ..
- appreny standard and gramt : each apprenticeship will meet the natuonsj local standard for particular ,200 variation styles covering over ,1200 job roles .

- the goal of the apprenticep process is to qualify to obtain certificate like ibee ..
- learn about score .
- the score structure and requirements are different type of specialized ...
*Key :
- apprentice electrician test :
Preparation: apprentice electrical technician test ETT test three are 40 questions with a .
- maximi time limited of three hours close test calculator allowed ,70% ..
Material content electrical to qualify ,,electrical theory ,electronics theory,power and current drawing a general ref book ,preparing test additional understand concey listed ....

- test 2 electrical theory AC,DC voltage ,AC sin wave and current peak
- ,polarity ,
-electrical unity measurements,
-resistance measurement unity
-
- motor efficiency .
-resistor ,
,Kirchoff low
-open or short circuit symptom ,effect caused by inductay capacity phase displacement ,electronics
Properties and operating diode rating ,
- half and full wave rectification circuit and operationel
 .- including the exclusive or gate ,3
- power theory
-,basic logic gate symboly
-,transformer operating loss
- primary , secondary.

- transfo banks three phase motor transformser bank

Transfo CT theory and operation ,multy rating rating classification ,CT burden ,polarity plunger relay with association contact ,clapper or plunger relays with associated contact ,
- schematic diagram interpretation.
-
Question .in the space provide write the following conversion 10050 ohm ,in kilo ohm ..
Circuit .

_ the circuit resistance increase .
- the circuit current increase .
- the voltage accri each the two the amount power consumption resistor increase circuit remaining ..
-circle corrected statement that describe operationel of diode .
- diode allow curenty to flow when the anode is negative in relaty to cathode .
- diode allow current to flow when the anode is positive in relation to cathode ,diode are only used DC system ,
-never a power transft with with with a nameolt voltage rating ,of 34,655 kV to 21,95 kV written answer ..
- show below is a transformer with the number of turns between taps in the space provided write the calculate voltage for taps x to x3 when 200 v is applied to wind ,x1 to x5 ,,X2 to x5 ,,5200 volts applied 20 turns ,20 turns 39 ,turn 40 turn x1 to x3 ..= ..volt 6 analyse the circuit below assume that all switch are open initially and SW,#1 is closed,circle the correct stat.lamp#1 and # 2and3#are lamp# only is lamp ,#1,2#,#3 are,2# and ,3 # lamp# 2 # are ..
- Questions: during a saturation test of a 1500/5 multi CT ,400 volt is applied to x# to x4 tap the X2 to x4 tap is the 1200/5 ratio wath is the test is being conducted on Wye connected set of current transformser,test current is applied through both the A and B phase relay relay and ground relay ,c A and ,B phase relay and ground relay ,c phase Mmeter c phase write in space provide the calculated power consy in DC circuit that has current of 254 amperes and circuit resistance ,25 ohm ..
- power = .
Circle the correct statement from the list below for circuit contains resistance,capacitive reactance the voltage and current are in phase .
- the current leads voltage..the voltage leads ,is 90°

_____
 answer .: 10.05 ohm ,
b=12,470 V,
C= 123 mA,
D= 10,600,00
- diode allow to flow when 12,470v,,,123 mA,, 10,600,00w the circuit resistance increase ,diode allow current to flow when anode is positive in relation to cathode .
4 turn - ratio = 2,9:15×2to × 3 = 60 volts lamp only is ,7 a ,500 v , b phase ammeter , a Nd b ,phase relay ..

_____
Objetive : install maintain and troublest communication installation .installing and testing fibre optic cabling and determination,
- select installing and terminating data communication cable ,maintaining repaired and testing data communicay cable ,installing maintain

troubleshooting alarm system ,
- installing and testing community system components,installing maintaining troubleshot audio visual ,determine layout ,installing testing testing security system determine ,installing determine layout and installing clock system ,testing the layout installing ..
- install test fibre optic cabling draw select and power ,tools equipment and verification cable pathway and installing and in accoy with CEC ,OEC,OBC ,ste plan ,manufacture ..
-

-**1*.4.1.2.35* - manufacture specifications,**
site plan
- ,manufacture
- compagny standai and customer.
- requirements.
- date completed trainer signature apprentice. Install ,maint and troublest fire alarm ,system to provide all necesst interconnection supply ,signal wiring ,detection wiring,door monitoring,fsn air control ,elevator homing ,s prinkler detection ,monitor raceway wiring ,voice communication ,system in accory with standard,,,
- installing and test community system components by and device : provided test and verificayv site plan manufacture instructy ,
- date completed ..trainer apprenticeship b,,Audi visual system instsjk,,
- communication system all interconnection such supply ,signal wiring ,detection wiring and entry exit monitoring by installn,testing wiring system components of clock system testing verifit ,,
- constructy maintent electrician ,select maintain operate test and measuring , equipment general perfot .
- objective: maintance and operate test and messy equipment by laying out and installing power and energy metering by laying out installing power and energy metering equipment,selecting operate maintain insulation ,tester ,selecting operating and maintay oscilloscope selecting ,operating and mainy high voltage computer based test eqyit selecting operating , operationel fault locator ,selecting operating high voltage test equipment ,selecting ,operating chart record ,test eqyit ,operating and maintenance special soecisj test,power and energy metering equipment includy,device ground fault sensor ,static voltage ,regulator and remote field device maintain design criteria ,select operate and maint snslogb difitsj,,select operate oscilloscope ensure is correct operationej ,chard code ensure is correct in accordat,,control system instrument measure ensure is correct performance..select installation testing equipment ,calibratt procedure ,type wiring network and

verit proceduy.
* Writing a job docut communicay in the workplace instruction presented image ..job work include work order ,change order ,office memotendu,letter accident report for ,ensuru that documy are wiri clearly legibility and completi .in accordance ..listen to customer relation by listet attentively to custyvand co workers , explain v using verbal non verbal problem and procedure identified , compagny policy and procedyb.

G

to
me

-**1*.4.1.2.30.*overview: qualicafition framework and council occupation skill outcome base Val ..**
Assememt outcome base and moderator,:
-level provide a pathway for learner to understand assessment and if required qualifications as an assessor , learner who wish to achit these units could be assessing competence or non competence base learning , knowledge or skill ,they will select the units and quality that meet the requirements of wath they are assessing.
- level master degree honour bachelor undergraduate diploma certifiy ,use ,,level 1,23,4,5,6,7,8,9 award in understanding the principles and practice of assessment is a knowledge only award for those who are starting their journey as an assessor pratice but are not currently practicing ..
- the level1,2, 3,4,5,6,7,8,8 award in assessing competence in the work envt is for practitioner who the assesst the demonstrate of competence in the work enviy using the fy.assessment method observations examing g work product oral questioning and discussion use of witny learner statement , recognition of prior learning .
- level 1,2,3,4,5,6,7,8,9, award in assessing vocatt relate achievey is for pratictioners who's assess knowledge and or skills vocationally related subject area using ,assessmy ,written questions , assignment project case studies RPL .
- full details
Level 3 award in understanding the princi..
- accreditation number:
- type credit base qualicafition.:
- credit :
-Guided learning hours : 24-
- total qualifications time :

- last certificate

- **1*.4.1.2.35.*Overview: asssessment engineering system division : modelling and assesment for policy:**
Course home,sylabt,calendar, reading,lecture note project , and example ,assignt ,
***Key: modeling and assessessmen**t for policy explore how science information and quantitative models can be used go inform policy decissy making student will develop an understanding of quantitative modeling techniques and their roles in the policy process throuse case studies and interactive activities .
- the course address issue such as analysis of scientific assessessment process ,used such as analysis of science assessessment processes,uses of integrated assessessment models ,public perception of quantitative infot methods for dealing with uncertainties and design choice in buildut policy relevant models examples used in this class focus on models and information used in earth system in .system..
*Find by topics , find course number ,find delart,audio video ,online textt,new course ,most visit course ,scholar course , course MIT, supplemtaire resource ,translate course..
,about open course ware ,site stars ,media ,press releases
--model eny system diviy ; modeling and assessessment policy assignment b..

_____
- topics | Materials
_problem visited to the museum science.
- making model exhibit
- problem set: risk assessment models.
-risk assessessment model : student.
- problem set : applying framework to Cass studies.
- rains modeling of country posity .
- lrtao simulat exert instruct .
- problem set 5 : chemiy exercise.
* Problt sstt ,due session, risk assessment models your assignt is to create a framework for a risk asst process , continuing consider the work that the process Egan session ..
Ref : 6 lecture notes on
- assessessment model diagram to address some asssessment model diagram bto address criticit of the modej construct.diagram to facilitate generalizable detail ..
-; drawing model and submit it one a have diffet or 2 questions power point , questions b model improvement in these area ,orga health risk asst

toolkit ..
- documents.
- prepare .answer following review critique , asst ,wath are revise appriat to rush ,recommy , ..
- sessions : apply framework to Cass studies assignment will allow you to practice applying the analyse framework. Coverage si far case studies of modeling and asst for policy for assigmi ,choose a sxuentift assesment process relevant to decissy taking you may choose a process relevant to decission interested of cases we mentioned or read about in class ,
- describe your case :
- wath is the decissy process involved ,wath is the role for science or technical ..
- process salient credible and legitimately to that decissy maker stakeholders why reflect framework .
-was an adaptive managey approat take at any time during the assessessment and make decisions process ,if so descry choose your own Cass please provide citation bibliography where appy in your answer if case specify informed from your answer experiemental or some persy.
- problem ,due ,quest modeling country position develop a shirt position papper the ,the lositt ,a consist start ,negot outcome write a press release annout the outcoy of negotiations ,summarise the Free upon outcome and commit ,identify outcoy is good or ,
- questions ,reflect having negotiation process, ..
- wath are beneficial and limitations of sing ..
-

- country in the negotiations thought on persons role of lrtao chose negott whatever outcom you which , used issue of acidifit ,germat country in emissions years 1981 for the sake sovit union and Czechoslovakia ,
- modeling and assesment for policy , Noelle ..
- 1 introducty : who are we teach staff v proff noejj v dr Frank field ,our roles and rest introducty : who are you name programme ,sentence on resea..

Thesis topics / interested introduction.
- what the problem v s different view on science and policy .
- someone once said ,Ll model are wrong ,some model are useful syllabus overview on science objective course ,vs learn help to identify best practices .in using scientify information in the policy process vs idenstifucstons pillar assessment bvs understand issues such uncery communication vs and how to conceptualize police through the term manage issue in policy on decission b, scientify b term vs syllabus overview vs using experiemental bshould be take vs grad student bmaster or ph d

levej vs open to background bin natural bscience entb.. quantitative bcv some some science to background b..
- challenge wath science poursuit vs complex communicate social contract vs adres socisj need communication vvs fundamental bresesrcg multi schales , management bvs train interdisciplinary scientist vs improvement
- process post normal science contrast normaj vs normal science following shift high decissy stakes extend peer communication ..

- key to acing the police assessessment center examination b: candidate vjob selecting meNs , skill told sort about preparing for the assessment advice yourself . Faced your success the center you begit better.
-;study assesment center process : absolutely nothing in article the need of benefits or througly learning about the assesment center process your Xue to get online find quality book about police assessessment .
Assesment center have task to I completed task include presenting and oral resume an in basket exercise vhandling reading about the process depth task ..
- read books on leadership and management: undersy concept and using the rigth lingi is impory ground running promoting about asssessment b..
- prepare oral resume and pratice pratice assessessment center requirements you tell the assessessment b.aboutbmeans give oral resume . interview segment bof the assessment .a common mistake believe that you tell people about your self ..
- prepare for specific scenario ..critical incidence types scenario to practice writing and talking about active shooter call at school overturned .
- prepare for the interview questions : assessor will interview candidat each same auestt prepare wuestu ..

-1*.4.1.2.36.*overview : police management information system survey in Canada police force recently becomes,
General design quantity information component a output report and file inter action , the titles . Implementating.. technologie .. design process issue , management infory system ,record central statistic record
- law enforcement record system , description file name , database format ,case geofile maintence geofile used validate,reporting area x,y,z coordinator information cross ..geofile geography information basis communication coordinator creation configuration b, juvenile default age .. property flagged with adequate warning to prevent inadvertently damage law enforcement b,,

- use case diagram interfaces information RMS an incidence number close location access and possible update variety local system ,court prosecutor final human resource system and multujuridusctiin information ..data exchanges ..
- standard function specification for law enforcement record system ..missio n standard low enforcy RMS sucessded ..agency. ..
- service , department of motor ,vehicle , transformser drives under the influence transmission ,
- specific FBI bureaux .
- model health insurance..
- council mobili data ,master location master identified,master vehicle ,national crime ..
- execuy protection ,open datat,connectivity office justice ,program , identified ,police , proposal regiony information ,
- manager system .
- operating procedure ,number ,,law ..
- real time crime record managet system for national security :
* Respective police police officer upload the data about ,wanted person , suspect person upload data , ..
*Advau of police system for developing countries : advantat for e government the police countries public accessible ,police system ,diary smsv,
- security communication since whole police interconnection as wide area wan topologies..
- crime reduction it possible to reduce any type of crime any section of country ..
- safety and securt incretion : for country and country citizen safety any kinds of the section our system ..
- standandar in order making the countries police admission world..esaeny.normak police system..
- software design for e police system :
Methodology : if we want to develop software we need to follow , being procedure ,name pin ,user DV feature match. Software development life cycle ,
- entity relation diagrams and context diagram .
- entity relation can express structure of database .
- diagram of our system ,
- data flow diagram for S- police system .
- data flow diagram for .data flow diagram concerned with understand the concerned with understand the processing with an organizatt the rekationsu .
- process graphically betweg external entire and process data store ,
Dfd
Level:
System invLide
- police form.

- complain
- form valid complain for valid
- form form fill up
- completed .
- invzlide form seriaj .
- invalid
- police I'd complain .
- test valid complain valid ID received ..
- electronics device .
- software special branches
- criminals record software vendor .media telecommunication n list too terrorist list custody list criminal injure
-;infrasybof an police system step challenge b implementation b.forbsoftware ..java my SQL ,,general police.. government bservicebrecitd case stolen carb criminsj ..
- installatt of locak area netwit lab at diffet location includy police station centre police office ,traffic police ,traffic monitory station ,prison ,,installer metropolitan area .
- secure internet access for police station cover
- establiy data centre for hosting web ..
- Deve.
- establiy of cyber crime detention cell development cyber law regulation framework ,scanning of reviouse record police station ,prison traffic data ,,
-:installation ,configuy and training. Of netwirt device of networking bsystem administration b..
- maintenance and support by vendor onnetwiry equipment blikr firewalls IDs ,ssitchbneywirj sensor police issuev perspective bdeveloing countries challenge related to impletation following bare face during implementating be police system .
- inadequate information and communicate technology with government as well across nationb..
- inadequate access to information police personej and by citizev
- lack of awareness of police personal and citizen ..
- lack of adequate training countries ,non acceptability of information and community .
- lack of incentive structure for police personej Nd government official-
- technoy necessary regulation legal framework .
- valide complain
Form
- stop service .
- check criminal I'd
- deliver service
- stop service

- RSA police training basic ..
* Introduction
Research procedure evaluaty . Form basic ,racial ,accomoday Nd facilitation , recruitment capacity ,basic culture .
- teaching learning and assessessment .
- course structure and content curriculum,academic training ,assesment problem area the impact discipline .
- mode orientation list register books form general usage schematic presentation.
- pocket book ,
- occurrence book
- detention of suspect detaining of suspects .
- admisst of guilt .
- crime register .
- property of prisioners.
- body search ,safe custody and treatment accused.
- cell register.
- exhib register .
- relief commander report.
- duties of charge officer commander .
- fits information of crime .
- statement.
- correspondence no.
- methods of obtaining the presence of an accused in court .
- scene of crime .
- arrest Nd the implemy of judges .
,- finger prints .
- road traffic accident report

- plan draugthing
- giving evidey .
- circulation and cancellation of property and missing person ..
-*
Welcoming and orientation description of crime conduct as ekemt of crime unlawfulbesd
- criminsj accountability b.
,- juvenility .men culpability intention negligey..
- murder: definition and intention .
- culpablf homicide : definition ..
Assault : definition ,element ,unlawfulbesd and intention .
- crime injurs : definition ,conduct ,unlawfuness ,factor crime ..
- pointing of a fire arm : definition unlawfulbesd.
-;rapt ,theft .

- Ribery and exortorsion
 -;arson ,bridery defeating course of justice .
- contempt court ..

* Criminals Law
- liquor act definition restricted point closed days ,supply liquor to juvenile rigthnof administration nptemisse ..
- dependance producing substance ..
Sexual offences ,brothel unlaev,sexuel youth ,idiot imbecile..
- dangerouse weapons act ,defbcomon lowv declaration
- arms ammnuy act : definition bpossesion weapon throgth license authority ..
- trspass act : prohibition entering or presence upon property land .
- act prot ..
- house breaking with intent to commit a crime..
- statutory .
- the child care act : removal of certain children to replace safety neglected child
- inquest act : investigation into circustat.
-rosf traffic act ,duty of driver in event of accident reckler negligent incosiderating ..
- * criminal procedure :
Schedule I offence methods securing attandance of accused in court manner and effect arrest.
- arrest by police officer without warrentv,civilllis force entry into premise for purpose for arrest .
- use force in effecting an arrest used of fire arm by member of the force ,s 9252 ,video force.
- escaping aiding escaoe submitted bname address search search and seizure of article statement ,may seize article ,stats seuzs certain article ..
- search warenu search without search warrant entry of premise for put of obtaining evidence resistance against entry or search unlawful search .
Scgeduj parent guardu juveny .
- general law amendmt act ,62/1955.failure in giving a full account possession abscent reasonable article legally .
- orientsy :
- establiy of rdnsa saps structure ..
- other police force in s in relafy force reservist and police ,different to whalifiev.
- benefit for member of the force aid schemes.
- policing , coercisr action certain sort safeguy society legislation provist and activities .
- goaj policing objective population more people cause more crime interaction between people communication
- partenship in policing .
- police community relat.

- public attitude class duscuy.clsdf indirect contact .
- direct contact plan action .
- the benefit good police ,community relay .class discut .
- dealing with a complain in case rape misconception regard raor ,effect rape of victims .dealing with rape victim,factor that may influt,
- case that are reported at charge office ,Cass that junior police office must of necesst deajt with himself .work assigntbfed cladd discussed b.videu.
- disciplinary order .

Complaint against police by member of the public .

- repugnant remarks.politiczl discussion ,afremmdt between news papier press ,Deb ,gambling smoke drunkrs intemperate habits complain and redress of wrong .,
- police community : crime orevet ,crime ,eleminatiin opport the role police prevei and role of indtution prevention of crime prevey Bilitu patrol.
- civil claim against state .unlawvact perfot in the line duty .
- civil against state .
- the pricipl giving of giving evidence : the effect fear in the witness stand knowledge of the legal asoec behai ,..
- dialogt and negotiation skills.

Humain rigth

- s police code conduct .
- professy .
- management of charge : daily conduct by member in face police change ..

------;-

-police acts regulation

the function sa police power and Durie member of the force .

- employment of the force in time of emergency limitations of rigth resign .
- contravention member of force .
- dismissal ,discharge ,or reduction in rank of non commissioned members force summary dismissal .
- prohbii on certain dealing in certain article unlawful receiving possession of property belonging to the force ..
- reward for extraordinary dillingencr or exertion falsek pretending bto be membt ..
- wearing of unigftb badge interference bwith member of the force..

_ regulation : interpretation of term superior day off .

- member to place all their time the disposal state regb..
- vaccination inoculation marriage and family change ..
- leave of absence.

Granting of leave

Granting of suck leave .

- offence against duty and disciplined.

- trisk by commisst officer under section section appeal against conviction and sentence and review .
- liabilt for deficient loss ,demage ,or expense and recover thereof residence address and telephone number quaetes.
- standing orders stores ,room inventt ,personal equipment sheet .
- building site and ayaters fires armsv ammunition.
- standany .
- special force order general : interpret of term motor vehicle ,police motor vehicle accidents ..
- use of governy owned vehicle ,office purpose ,conveyance immediately household ,towing vehicle ,traffic law and regulations b.
- counter and considerate driving ,safe custody unautht used of govermy owner vehicle.
- forfeiture of state protection .
- reporting and investigat of collision .
- conveyance of prison .
- loos object article..

_____&&

*Municit police unit .:

Structure ,function ,activities ,duties and regulations , examination assign Orientation role of chaplain ,introduction police ethic ,belied resoectb,class discut ,respect for calling ,resoectbmarisgebrespectbfir property , respect for country and culture..

_____

Musketry ;

Care maintenance :.

9mm Beretta pistol,

- 9 mm Walther P38
- 9mm Z 88 browsning shotguy.

Beretta 200 ,22 bore shotgun

- breta 202,1$ bore shotgun .
- Walther HMC ,
- R # rifle .
- test .
- first aid .
- shooting range ,shotgun and HMC.
- shooting range pistol ..

*

____

Foot drikk

- salute ,showing respect,sectional drikk ,rifle still,ceremoniak drikk ,drill for inspect .

_____

Physical education

Free standing exercise ,fixing ,tonfka ,wrestling ,lifesaving ,fitness,self defence

'
Cid Education .
- admint :
- duty ,goal and function of the Cid ..
The principle of giving evidey .
- theory .,theft roberty,housebreat and theft ,mutderv.
- guideline handling complain ..
- crime investv,the CRS duties ,video ,akternattv,scene of crime ,

Theory, pratical bicke theft ,searching ,feddbat and discussion..
- evidet collectt and control ,
- statement : theory ,praticK home assignment .
- informers : theory ,pursuit ,claim for informers and completing of claim forms ,
* Power of arresting person : power search .
* Interesview :
Type of interviy ,interogay ,rigth to interrogation,rigth of accused ,preparau for intervy ,judge rules ,admnision ,confesst ,pointagd out ,
-- indetificatiin parade theory ,praticakb,
,- finger prints theory praticaj .
-:case docket ,purpose and layout ,investiy diary reason for it used and complain .
-:case control register and Cass book ,handing over , inspection purpose of and certificate ,disposal of exhibits ,responsibiy before completion .
- * relationship with prosecut ,bauk reactive policing,globJ vie of security situatt ,movement control ,crime information coordinating csntrev,
- scene crime house break .autopsy ,theory wath involves ways of conduct ,documy register identificay,use of decided cases ,pratice of passing out parade ,
* Administrative: leave ,sick leave,leave for study ,exam purpose maternity leave ,
* Filliy system ,usage and dispoy of archive ,personal document .officit correspondat ,minute ,application application report ,board inauiry ,completing , statement by with..
* Introduction to computer trait .
- goverment owner vehicle .
- collision ,management ..promoy,logistt admnistratv,logistic ..financial admnistray ,different claim ,receiving ,hanling of money ,remission register .
- pratice for passing out parade ..
*___&_&
Visual policing :
2. Patrol: .
Phylosophie of patrols
- management maintenance of governy owned vehicle ,f0 ,G ,3 A / 1987..

- management and maintenance of gov
- attending to complain
- reaction time .
- general action toward complain with ref complain ieb assault theft housebreak ,stick theft ,reckless ,negligent driver no collision.
- power of arrest and search .
- his lawful arrest is Ffecfed
- rigth of arrested person legal assistance .
- attending , handling house molest famyy squabbles Bd action the scene ..
- road traffic collision .culpables homicide ,seriousd injuries ,information by investgaty ,plant correct filling out forms ..
- driver influence of liquor .
- roadblock and searching of vehicle occupants ..
- searching of builduy premises.
- action ,conduct at scene of fire serious crime Nd the preserving of the scent..
- arrest ,application of judge rules by member first , on scene ,admisst confesst ,exhibtd ..
- testifying Nd conduct in court ,video ,duties court ordely ,
- priority ,setting of goak ,times managemy ,
- crime prevey and prevent power .brie community,taking down repeating of repirf ,
,- radii ,radio control ,speech procedure
Passing out parade.

..
* Time table : sjs
Monday |
Time ,o7: 29 to 16h..
- skikk area covered in metropolitan police training materials.
Communication

* Verbal | non verb | listening
Voice volume ,intonatii. ,word soecefs vocabulaire b,,€€ body position ,touch ,eye contact gesture ,/)) listening encouragt ,gesture , summarise b,eyes contact..
__'
Investigation :
- question tech • enquiring approach |€™ use of infort .
,- logistical seauenct ,variety style open ,probes ,summarise ,links ,,|€ check and confirm ,maintain open mind ,question fault ,
Use infirmatt , use all
Physic finess
..

*__1.4.1.2.38. overview : electronics and electrical ent ,technology research police ..__

__Information management system__

__- introduction :__

__,- financial programmes :__

- administration
- information used to generated performance information or predetermine ..

* Objective :

- technical indicators description and information
- information system used to generate performance information on predetermined .
- technical indicators description and information ..
- flow ,subprogram me : crime preventt.
- subprogramme ,border security
- programme detective service..

Investigation.

- criminal record centre .
- forensic ..

* Programme crime intelligence : information system used to generated performance information on predetermined objective:

- technical indicators description and information .
- crime intelligence operations.

* Intelligent and information management .
* Protection and security : informed use to generate performance information objective ..technical indicator description information .

- protection security .

* Vip protection .

* Static protection .

- government security regulator
- presidential protection
- physical security admnistrat system tidy technical indicators .

Technology many ,provisioning plan , important person vispol visibility ,

* State perfot transform and professional the service number of internship undertaker manuej system .

-;name system descrupt Manuel ,

Internship and advertise ..

Human resource personality police persak ,salary , function integrated humain

Independent police ,indicator system ,,

-:percentat of discipline case finalised Manuel register name system :

- excell spread sheet capture data regart disciplinary case finalised and pending :
- work reporting is based on approved project plt project information ,police financial ,polfib
- work control system : maintained departt of public work planned
- system name system .
- descrptt approved project plan .
- saps project and polfib
- saps system many police facility project office ,information progress .
- template must line strategic plan objective , project execution plan .report document information terminal .
- scope of work :
- building projects current finant years outer
- indicator provide the number of new mobile community service in rural and other area ,
- purpose : importance .
Service center deploy in ruraj and other remote area in order for policing .
- new indicator .
- new indicate output source .
- support evidence for quarter Lt annual reporting provision administration system.
- calculation type cumulay method of calculation ,
Actuaj number of mobile community service center distributed at the end of the current financial years ,data limitatt .report .cycle quartly and annually desired perfot , mobile point reporting. Responsibility division supply chain management impletation b.
- responsibility component head : vehicle management official directive
* Guidi and instruct contract ,date 2916-19-13 specifications service centre CSC build on a chassis cab truct spec 3123/2016 date indicator title indentifi clandestine laboratories indicator ,criminal grouo create clandestine laboratv,illicite chemical equipment creation b.
- purpose : important organisation crime syndicate involvement supply drug new indicator type indicator ,outsource ,document audit ,case docket: enquire files ,database system used for processing and reporting perfot information manual independent database , system support evidence .. manual idependy database GACS ,
- system supporting evidy f..
- data incident report capture on database ,calculation type cumulative methods of calculative methods of ,, laboratory..
- report reporting cycle quartly and annually desired perfou ,100% ,29 reporting responsibility director for priority crime invest implemt responsibtb.directorst implement responsibility official directive instructybsaos amendtv,act 2012 ,act n ,20 of 2012 non proliferation of weapons of mass desteuctt act ,1993 ,act 87 of 1993:.

_____
Overview framework policing , qualifications core and elective component

award learner ,248 credits , fundamental component consist of units standard to value of credit 56;
*Training and dt 52 credit police : to advice and counsel learners .
- facilitator in complex situat to create learning and growth .
- conduct moderation outcome based assesment

*Resolving of crime investt credit : conduct and investigat
-, handle suspect in the investigation of all
ege crime
-,admnise case ,
-present evidence in court
- * dog handling ,select dog in service work training ,move tactt with a service service ,conduct a human scent identification trail humain scent identification.utilize search and rescue dog in structure scenario to locate missing person and evidence ..
* Forensic s : demonstrate , and understanding of forensic sciet .
- demonstrate and understat the specialized field forensic .
- assimilation and present specialized evidence in court of law ..
- demonstrt knowt of temperature calibratt .
- develop : elementary calibrat system for reference weights balance pipet balance pipettes .
- demonstrate understanding of criminal justt..
* System : implet basic safety procedure in emergencies .
- perseve evidence on a scene ..
* Industrial relation : analyse complain and report relating to reffered dispute and select appropriate resolution process ..
- demonstrate and apply understand of basic conditit employee .
- demonstrate and apply an understat respon to collective ,agreemt and bargat council ,interpret apply collective agreements.
* Bomb disposal:
Identify and explain explosives .
- demonstrate an underst of the histot and the impact of explosive and explosion , conduct planing briefing and debriefy session , identify and explain explosives ordancd ,identify and explosive ,
- protection services : compile a threat and risk design person ,
- provide static protection of design person.
- provide close protection to designated person whilst in transit .
- provide close protection to designated person whilst in transit .
- provide pedestrian escort to designated person within close protectt environment.
- apply advanced driving skills ,technique in defensive and offensive sutuation

*Career management :
Management indivy career ,
Apply business ,

-performance practices.
- monitor staff performance.
- mentor employ in the performy enhancement process .
- advice and counsel learners.
- apply basic human resource practices .

* Personeel management .
- manage the human resource of a mission .
- apply basic human resources pratical.
- monitor to well being of clients and personnel .

*Supply chain management :
- develop acquisition requirements to meet stakeholder .
- apply principle of supply chains in freigtg.
- admnised the loss management and civij claim process .
- develop functions soecisj for complex acqut..
* Communication service :
- formulate and co-ordinate goverment communication .
* Management communicat project .
- managemy communicay project .
- support and data communication equipment .
- developmt and present and integrated and present an integrated markett present an integrated marketing communicTy .comparing ..
* Criminalistisx : interpret forensic science information ,
-conduct prelimit investigy.
- demonstrate an underst of the field of finger printing .
- explain visual recording of scene incident .
,,- justify disclosure or non disclosure information in an ethical framework .
- assimilate and present specialized evidence in a court of law ..
.*understerding of the criminal justice system :
*Hostage negotiation : demonstrate an understanding hostage and suicide negociation .
- apply fundamy of hostage suicide and kidnappi negotiu.
- participate as hostage negotiator hostage negotiation team ..
* Border control :
- perform duties of a police official at Port of entry :
* Apply relevent legislation ,detect and identify places of concealment .
- profile and selected goal at Port entry .
- admnister and control movement of person and goas across internattat port..

_____
Criminal investigation principle
Administration and cimmunicat skill,
- information manat :

- manage system document information .
- service delivery .
- framework regulatory.
- crime scenes and incidents.
- investigay methods techincah ,vehicjd ,
- paralegal assistance legaj low crime traffic low.
- study material fire arm policing schookb

-

...

* area security surveillance, private security ,saps ,netropot,community police ,private investigator..,,detective service , instituts violence. ..

* Police officer entrance exam : office measure the basic skills police perfort test area Marg test grade bases
, interview why want to work police officer . Law enforcement v like any job , when evaluating answer insoirat .
- you care about public work as ,you doing enjoying ..
- addit police officer police m...

_____
* Introduction science police :
- section career orientation profile, Engineering duty maintenance :
- selection process / choose a career answers.
- question .
- career understand ..
Entbcader junior , wath career .fire ..
Making detective ,unterd ..
...

*key department program detective.
*,crime intelligence , protection security ,resource consideration,risk , long term infrastructure and other capital plans , term infrasy and capital assets plan ,information and communy technologie,human resource development ,service delivery improvement , strategies overview, to creavsafe mission mission to prevent combat crime that may threaten safety and security of communiti ,investigate any to prevent and combat crime , ensure vthe offender are brought to justice ..

- participate in effort to address cause of crime .
* Code of conduct :
- particpt in all endeavour aimed address root cause of crime ,
- preventing LL act that threaten safety or security of any community .
- investigating criminal conduct that endager the safety .bdiga constitution low ,:
Act in rendering effective high standard that evry body and continuously strive towards improving service n
Utilise my own risk contribute .
- courthouse that impartial ..
- constitut mandate sOs section 205 .
Objective : prevent combat investigate crime ,maintain order ,protect security..
- minster police responsibiy for determining national , in relation saps act 1995 act ,68 of 1995 ..
- fire arm control ,dangerouse weapons ,national key pint act ,second hand good ,private security indut regulation ,act 2991 act intimidating ,game theft ,, independent police investigation directorate , civilian secretarial for police..
Crime service independent.cpfv

_____&&
Goal .. researche monitoring
Into by national commissioner RSA ,
Strategic ,vision ,mission ,code conduct ,legislt ,constituy ,policy mandate , situations , performance snvirot , organisation environment,the strategic planning process , strategies plan ,,outcome procedure ..
* Criminal justice degree : buchellor level overvit of criminel system students learn about segment topics evidence of legal counsel coursework.
- criminolt ,the juvenile justice security and policy ,intro to law and correction .
* Police studies and law enforcement degrees : these types are prevalent offered certificate bachelor's b history police system v.
American policing, probation and parole,intro to criminal justt , contemporary police ,stragies ,
- student on line participate communication police
.
Online peace certificate undergraduate program in criminsj justice police studies and law enforcement ,,
-* police science and law enforcement vpubkic criminal prepare career file report..
- education information : relevant program found associate bachelor master and doctoral degree in law ent criminal justice enforcement and ,certificate program program combine physical demande variety course ,in criminology and law psychopedagogie associate degree ,administrative roles in law , master degrees ,

-assiciate degree in law enforcement ,bachelor's degree law enforcement ,bachelor degree in police science .
- master degree in criminal justt top science degree law enforcement ..
* Distance learning police officer want further training ,associate degree in police on line ,bachelor degree police on linrv..
-*overview :policing fundamental course : introduction police familiarise students with responsibility of police officer howv operate in criminal justice legaj issues regarding police officer roles studies exam constitution the penah system and procedure ,steps for police patrolling and overview of they look when patrolling bare discussed bhired or sponsored b..
* Crime prevention course : in a criminal course future officer become familiar b investigat address need student examine ,security structure and response include commercial vretail discussed class students learn about peepetrtvrigtg ,
* Crime analyse course : student learn determiner type crime committed methods by student commited collecting evidence and analizing data studies learn how to predict and anticiot future criminal ,crimes process technical proposrectuvdv police office read case studies lecture and study crimes updates and study .update technilogie and tools in police fieldwork ..
* Counter intelligence course: intermediate to advanced address's ways information is gathers counter response are developt ways to use the context of protecting ..
* Law ..
- on line

..

*on line degrees : online peace officer certification information ,classes course police ,forensic nurse examination ,course and classes ..
* Salaries and outlook : border patrol officer salaries info.
- duties and requirements ,salary info for master in forensic psychology:
-:career information:
Court bailiff : job duty requirements for becoming a court baliff :
- deputy sheet job outlook career ..
- school with cybercrime program studies detaikk Sherriff ...* Police cybercry studies detailed deputy sheet course classes trainubgb..
Peace officer planing pursuing law enforcement career can study criminsj orvlas prepare police academic.

_____&&&&
*:forensic science laboratory.
Any laboratory Durie ,preparing the specimen,calibrating of scientific , fragments analysis ,quality ,quality ,quality ,armored ..
Forensic science in the application of science : method in investigat of criminel and specially exam material forensic derive ,, biology ,chemistry

and electronics , units new built complex was occupy ballist question unit ,sa criminal bureau ,200 a decision b. Law
- ballistic unit : functt unite : rendering of effective service ,unit responsible examination fire arm and tools marks etching process are applied to restore number which have been .
The majority of examony ,conducted by the ballisty fall into three .
- internal forensic ballist ,external ballistic ,terminal forensic ,
The examinatt particyli in case alleged accidental discharge ,of fire arm and their mechanism to determine possible defect .examinatt of homemade instruments .
- miscellaneous firearm to determine whether or not they comply description definition actv,75 of 75 of #969..
- determine of calibration type of ammunition.
- identification of small ,arm ammut.
- determine of the possibly type weapon from which suspect bullet or cartridge CAS was fired..
- microscopic comparison of bullet fired as well as cartrt Cass to detert wether or not the we fired from the fire in case particut in case was ,used .
- the individuals of fired bullet and cartridges fire was used at more than one crime scenario .
- determine of type of calibre or projectile determine b.
Miscellaneous;

_____
-* scientific analysis unit :
Function:
Rendering of an effective forensics analysis service principle physic .a variety organic and inorganic matter or substance in analizing at scientific analysis unit ,typical ,organic matter platisc , synthesis fiver fuel and vefett medecinf prison inorganic matter include soil ,gold metal and primer residue..
* Physical matches::when two more piece of a broken object physically fit together to form unit physic ..
- paint : variation colour formulation and use paint make it physical exhibith with decission evidence play important role in case run collision vehicle and n which force was used to enter premise or a safe..
- soil : owing to its nature ,soik is readily transferable to item of clothing motor vehicles bthis transfers soik gratt as evidence in the analyse soik colour particle size mineralogy organic composiy of great importance in the investigation of Cass..
- filaments : examine of filaments of lights healigth ,brakr ligth ,tail ligth and indicator ligth in vehicle ligth collision can determine whether ligth of the vehicle concerned were switch on during accident.
- glass : is often found on clothing and.usefull evidence determine physical mstx ..
- metallurgy : field focuses on the characteristics of metal and other materials such as ceramic investigation : determine of cause of faillt of

material by surface of fracture .
- analyse of metals for confirmation to specifications..
- analyse of the surface ..
- coins jewellery and precioy stones metal , in order diamond rubies emerlard examine to determine whether genuine metal ruthenium, rhodium,,diverse analyse ,chemical analyse non performed ..laboratory ,alcohol quantity liquor illegaj sake..
- any divers chemical analysis chemiy brake ,fluid ,oils ,glues ,adhesive ..
* Electronic : examination
video cassette analysis ,audio cassette analyser,magnetic ,scenario electric electronics ,electrical ,electrocution ,crime related to computer,data retrieval , copyright on program,computer hardy,softy,voicev, comparison individual..
* Polygraph components : detector polygraph used detect any deviations in for example b..
* Question document unit :
Function : handwriting ,indivualuzattion compare present writing dispute document those person wether person documents bcass unambiguous.
- typewriting ,a typewriting or printed documents indivualuzattion as the,product specify.errasur obliterated insertion overwintering on documybe detected and writing be restored.
Forged signature and tracing of signatt can be determiy.
- bass material oapoer material ,used base for the composition documents can examination to reveal wether type manufacture..link other medium document .. apparatus stamps prints press ..
Damage ..USA dollars bank note are examined review authentic printers plate colours laser copies ..
* Bioloy unit : rendering of an effective biology unit responsible analyse of evidenti material biologi oring , body fluid tissue off degree identificatt DNA analyse microscot evident value ,DNA exhibition ..
- trichology : microscopic observt structural similt hairs found the scene crime to control .reveaj body ..
- scene invest support : components attend ,investigate crime scene biological natural performance anthropology investigate aimed,collect refer entimolot odontologie evidence perform mummifiej fingerprint and exhumation ,crime scene investt to collect evidence material further analyse la outside instuy and for purpose recobstryb anatomic entimologicv..
- chemistry unity ,: function rendering ,chemistry unity undertake analyse ..-forenst : drug analyt drug orosecuy agenciy investt of drug. Related crime assistance.
- analyse substaupoweders pills liquids controller, thereof with substatbcontrik act determine stranding and investigat drug related crime scenes with laboratory trained staff are available to reconstruct ,compiling physical prolifer intelligence operations purpose..
- common drug routinely analysed .natural syntheyx .marhaqualom,canabid ,Mohs..

- fire arm explosion investigat : analyse exhibith material after explosion determine what type explosive was used.rendered technical assistance bomb dispot unit evaluating home built .
Event of suspect arson expert .
- attendt fire scenes and performing a detailed physical ..
Plant ..explosive unity

_____
**
Recruitment and appointment ,age
Be at least ,25 but under 40 tease document proofs ,completed health wuestyb,meducat mentsj ,be good and sound character .
- fit the psychometric profile and must successful completion bdns no criminal record ..
-
...

- state rendered supply a product to the saps ..involved private security industrial trade liquor,taxi
Private investigat service not limitation b private detey intercep communication ..
- member correctional : service duties reservist normaj ...
Re inlistment reserve member or reserved ..
- ranks :
- training and skills development .,
-to established a RSA judicial education institutime in order to promote the independent ,impartiality dignity accessibility and effect of the courts by providing judicial educati officer administration of affairs regultb....
*****
* Fire arm control and policy :
Summary : RSA FC framework bimpose procedure requirements for obtaining ,competency ,license ,permit , authorisation to losses a fire arm to deal in fire arm or to carry activities inckud running fire training enterprise ..
- introduction: RSA comphrt fire arm control regulatory regimnin place subsidy contruj law ammuntb.
Saps ..
* Definit of firearm : adopt broad defint ..
* Rigth to posses firearm : full automatic , gun cannon recoills fun ,mortar ligth manufacture ,grenadev..
- projectile : rickdf manufacture ,
,- limitation ..
* Competency certificate license permit authort and accredt .
* Accreditation : public collectt ..

* Competency certificate : trade manufacture license ,residence business ..
* License to posses fire arm : license posses self defense : registration issue license shotgun hand ,automai person is eligibmd to apply..

Private collection ...business proposal ..
Tempor authirizatiin ..
Termination of a fire arm licdbddv declare registrar finaj protect certain crime ..
- fire arm dealers : person trade ammunutuin. licensd...-
- safe custy of firearm : ..
- fire arm free zones : consuktatt ..
- offenses and penalties violenturs..

_____
* Fundamet compulsory subject :
-:* career paths : joins the saps ,traffic agencies militaire ,security private security manat .
- communaute.
- introduction to policing ..

: -_--
Career assessessment:

* What portion of the one million does Robert suspect need pay the bond ,,
* Select the word or phrase that most clearly means the same as the underlying world .
* When the suspect refused to open the door the police executed the search warrant took door off if it's hinges.
Broken dowv,presented,signed,carried out ,.
* Identify the missoet word in the follt sentence ..
* The surprisint news andmated the conversation amongst the group ' surprising ,andmated,conversat ,among .
* Solve the follot :
28-3(-5),, ..
* Cindy goes withdraw money fing from the ground floor jhon take and elevator ,@rom .balance account wath is the balance of her account ...
* start

_____

Insulator,over
* Graduated :

* Police service : motor ..
* Motor mechanic engitb
Core functt : performance quality and cost efft repairs and my of saps

vehicle ensure a clean and safe envt diagnose and strip and determine the part require and repaired comoltet part request pee vehicle,completed job ,bricklatyhf trade check the quantity building : marerush of each site ,building fiundantuib you to fkijr levej plastering of specified walls accordt to plans building disabilt Ramos at all police ,station responsibility nfor demolition of facilit selected after complete of project usage and safeguat of all equipment material cleaning work environment..

- matric ncv levej ,plumbing ,n3: trade test :
Cored function trade test core functt plumbing duties obtain material for installation laybabd join pipes read and interpret sketch per request cleaning working environment busage and safeguards of all equipment material and ,apply occupt , ..
-:electrician internet infrastructure maintence service ..core interpret sketch per request ,performance electrical on activities,project obtain installation usage and cleaning of working environment...
- carpenters joints ,cabinet make ,infrasture maintenance ,,.- caroentrie : read interpretation sketch set operate woodworking v machine operator ..machine motise power ..wooden product..
- apply occupatt ..
- supply chain management :
Quantity : surveij ..provide cost estimates and cost advice prepare and compile contract documy and specification bid tendered financisj building project under execy..
- programme project

:
Engineering electrical
: core functions ,assist ensure technical compliance quality on constructy maintat sites faculty prepare bidc insure implementating.

* **1*.4.1.2.340..*Overview:Mine health and safety ,actv..:**
- .
Objective.
- inspectorate mine health safety ,
Minister power
*..applied thermodynamics
Air and gas compressor and blower ..,air motor,compressed air ,receiver , refrigerator properties
Psychometric table chart..
Steam generator boiler ancillary equipment,
Properties steam .
- heat balancing .
- steam and gas turt.
- internal combustion engine.
- heat transfer.

- fuel and combustion.
* Structures and strencty of material:
Simple stress,
-;simple stress and strain.
- walled pressure.
- torsion of circular shafts
- shear force bending.strent ,second bending stress
- cTenaries.
- fatigue failure .
- mechanical chemical properties of metal .
- twisting of shafts .
- ropes. ,properties of different.
- types of roles.
- retaining concretv...
Insulator ,
Overhead line , economic power supply,
- maximum demand .circuit breaker.
- high frequency transient methods earthing.
- storage energy .
- fault discru.
- symmetrical fault communication ,lighting protection ....
- theory of machine conveyorv winding plant,double drum signlrb.ropr.
- ekevaty traction ,inertia ,displaced ,static and dynamic b bakancuyv..
-;conditioning sabs 10266 safe use operation and inspection of man
-; .belt homologation of respiy equipment.
- ventilation brattices Nd ducting ..
Explosive dust atmosphere or both ..
- DC power machinery for used in hazard area in mines ..
- the used of ligth metak in hazard location..
- installation inspection mainyenat of equipment used explosive atmoy.
- installatt include surface installations on mines ..
- installation inspection of equipment used in explosion ..
- electrical equipment installed underground.
- the installation inspection repairs and overhaul aooartus in explosive ..
- the classifiy of hazardy location selected of apparatus for use ..

- regulatory requirements explosibprotected .- worn escaoe type beatthinf ..
- circuit breathing apoaratt compressed oxygen or comprehensive oxygdv ..
-:code of practice for performance operation testing maintence ..
- gas measut equipmy primary ..
Battery operated flammables gas ..
- the measurements and assessessment occupational noise consert purpose sabs .

Electric initiation system shit explored based ..
- the safe application of detonator system for mining and civil blasting

application .
- electronic detonator system .
- the safe application of detonator system for use in mining and civil ..
- gad measuring equipment primarily for use in mine .
- battery operated portable ,flammable gas measuring instruments warning device ..
- compliance mandatory code of practice ..
- the design erection use and inspection scaffot ..
- refriget system include plants
*'

...

- the new saqa certificate of evaluation back front ..
- the south African qualicafition authority ,saqa is Mandy in term of the NQF act ,57 of 2009, to .
Oversee the further development and implementation the national qualification framework NQF ,
- advance the objective the NQF and ..
- co- ordinate the three sub frameworks outline below .
* National qualification framework:
- sub framework qualifications type | level | |sub frameworks and quality type ..
.- high Education qualification sub framework HEQSF : doctoral degree doctoral degree professional level 10 ,
Master degree level 9,
Bachelor post .. level 8
Advanced. Level 7
Advanced. Level 6

High certificate ,occupation ..
* General and future educator :
National certificate :4
intermediate certificate ,3 occupation certificate level 3
Elementary certificate ,
General certificate 1 : occupational certificate level..

_____
Management designation security manager :
* Generic management categie class of security
.skill programs | grad replace| unit standard || NQF levekv,credit
- generenercis management : explain the requirements for become a security service provider.,apply leader concept in work context gm4:,apply

the organisation code of code conduct in work environment b,conduct structurak meeting ,employemat system approach .
- manage expenditure again a budget ,monitor the levek of service to range customer ,motivate ,priority , solve problem decission and umolent solution ,demonstrate basic understanding of primary labour legislation that impact on business unit..
- manager guard response assest transit in industr industries ,generic skikj must : demonstrate understanding of crime prevey ,conduct a security threat assessment in a defined operations area SSP ..
* Electronic skills programme installer : explain the requirements for becoming a security service esip , demonstrate knowledge of electrical safe working practices NC electronics ,apply cabling methods ,apply basic business ethic in work environment lock ,identify inspect use maintain and care for Engineering hand tools n c electrical ,select use and care for engit power hand tools lock ,use elementary electronics to electronics system , determine installation requirements ,explain the systems ,es,,sinstall electronics equipment b,install a basic radio transmiy and antenna system ,
* Electronics skill programme technician ,skill programme installer must be completed : configure installation ,assess threat for security installation purpose ,determine and rectify faults in an installation ,interpret Nd use inform text ,provide custt service ,accommodate audiancd and context ..
* Electronic skill programme cable : explain the requirements become a security ,demonstrate of electrical safe working practices electronics ,apply cabling method , apply basic business ethic work enviy..

* Electronics security industry monitoring interception device
* Electronics skikj programm elementary electronics as applied er instsjjd ,,: select use

,determit installation requirements ,explain the use installed system ,install electronics equipment b,provide customers service ,accommodate audiancd and context oraj signed communication..
* Electronic security industry ,X ray inspection metal detection and bomb detection : operate X ray screent equipment withing a security..
* Electronic security industry (fire detecty):
- electronics skill programme installer fire detecty ,skill progratcabler must be completed : select ,,explain installed install fire alarm and detection system ..
- electronics security industry alarm : system ..select used cars for Engineering power tools lock ,used element as applied to electronics system ,determine installatt requirements ,install electronics equipment ,provide custt ,acommot audiancd and context oraj sign communication ,install a basic radio transmitter and antenna system ,
- * alarm system : configure and installation ,assess threat for security installation purpose , determine and rectify fault in an installation ,interpret and use information ,,

* Electronic security ,access control system : installer control ,skill cabling : demonstrate and understand of electronics access control installer installer ,access control system
* Technician ..
* Electronic security indust designation ,electronics security officer : electronics security CCTV : installer CCTV , : demonstrate an understanding of CCTV ,installer close closed circuit Televsion ..

* Control room operator : designation control room shrveillat room operator :
Explain the requirements for becoming a security service provider ,operate effet with a specified control room envirt ,operate a computer workstation in business environment apply health .
- control room supervisor ,skikj programm control room operator must be completed : outline the legal environment of selected industry ,demonstrate basic underst of the primary labour left that ,supervise work unit to achieve work ,perform one one training on job ..
* Assets in transit sector : advisor consultant asset in transit sector ,Patrik officer access control protection officer skill program : outline the legal environment for a selected industry ,demonstrate underst of crime ,conduct a security threat assessment I. A definidy operai ,monitor assess of manager risk ..protect asest in transit ..
-* advisor consultant close protection officer : compile threat and risk assessment for close protectt operation ..
- close protection officer skill programme must be completed ....
- advisor consultant design security consukt. ..access control asset officer ,skill ...- advisor consultant response sector ..
- patrol officer access control officer ,asset protet skukj prograbb : Conduct security threat assessment in a defined operational area coo ,monitor assess and risk ,provide security reasons service

...

* locksmith / safe technician :
Management lock smith safe technician : generic managemt skill programme must comply: apply health and safety to a work area lock .. grade. .
- gog handler trainer supplier : management dig handler trainer supplier ,generic mat: survive kennel practices ,care service digv...-

management close protection industry generic skikj ,conplile a thread and risk assessment for close protection operation cpib demonstrate of the fire control act ,200 act no 69;200;
National cery : policing ,visibit police ,, safety security ..
..

* Safety precautions : caution CCTV .
Warning
Caution:
- technical parameters :
Pickup device : 1/4" Shari CCD , 1/3" Sony low illumt CCD ,
- number of pixels : Pak : 512(H)×582(v) NTSC : 512(H), 492..
- horizt resolution: 429 tiv,,
System of signal
Back compilation ,529
Electronic shutter : auto (@/50(169/69)_1/100000sex.
-AGC
- white balance : autib
S/N..
-gMma operational ,
- synch : internal .
- video output levejv: @.0 vob- / 75:

- waterproof coating ,
Lens .
- infrared ligth power input video output ....
_____

* Conduct asset in transit vehicle operation vehicle : law military and security , sub field society safety ...
.
Prepare vehicle security equit and system for asses in transit protection operationel ,.

- manage transport of assets and crew during assesr in transit operationel v.
- operationel a security vehicle during emergencies situation .
- describing the procedure to return and store the assest in transit

_____

-;*conduct evacuay and emergency drills : security .
- fire identify and ases the emergency or safety sutuation :
Energy or safety sutuation : fire ,bomb, hazardous material , no.
Evacut ,partial evacuat ,full evacuation v, ,,
* Further education and training special security pratice ,
* Future education training certificate sociaj housing supervisor..

* National diploma v
* General education and training certificate transform .
* National certificate profest driving :,,
* Driver lives ,exam traffic traffic related goverment low,exam motor grade code ,,
* Transport and logit operationel ..
* Apply advanced driving skills ,defense driving : task team traffic : law ..
Apply advanced driving skills technique in defensive and offensive situatt : apply relates to vehicle dynat to reduce driving risk ,demonstrate technique use avoid accident and maintain control ,apply technique to improve driving skill...
* Further education and training certificate use of fire arms ,,
Explat apply support legist requirements in the training hand of fire arm ,, apply supervise technique with fire arm training ,select and fire training techniqt ,handle use fire in range of ..

* Road safety advice for foreigners driving in South Africa :
- overvit/ background information : ensure safe tourism road ..

- road infrastt / tool roads :
- rules of the road / traffic enft : drivers licences :
Regulation
- rules of the road :
- speed limit : general high freeway route 120 km/ h (75 mpg ,secondary rural ,build area ,69 kmh ..

_____
Defence intelligence :
Backgy: militairy skill development systet : defence intellectuel recruit ..
- minimy requirements : Pre emplu screeny psychometric testing and security vetting ...

...

-***1.4.1.2.341..*Overview:trafic : vehicle type and configuration are accurate indentified in accordance v, information is obtained in accordance with standard operational procedures relevant ,data veht load driver operate is capture in ,peemissiy masses are determinat in accordance with standard operation procedure and legislatio**n ..
- the weigtt result are assessed in accordance with standard operational ..- driver and operator are identified accordance .with relevant ...- offences are identified in accordance with stand operational and legist.
- supporting is ..

- further education and certificate road traffic management..
- national certt policing.
The national road traffic regulatt section criminal procedure . dangerous load....
- sgb traffic ,related govermt law enforcement..
- further education and training , certificate road traffic many : ..
* Traffic signal starts : notice of defect : knowledge create duty , construction .
- risk management strategies.
- development of methods procedure.standars the investigation of new or alternative traffic signal ,over control function such as signak design layout data collt provide guit complex signal installat central control ..
- prepare and review traffic management plans include.
- professional engineering technology would normally involve ..the work signal division ,overall managemt .
- traffic data collection includes traffic ,speed saturation flow accident rate ,design , warranty studies for the installation of new traffic signal.
- priorisation .
- investigation into new installation.upgrading existing ...- developmt of method procedure ..
* Manpower and electronic..engi
-electricL and electronic engineering professional are those skill in electrical and electronics ..
Involve the usage digital electronics involved the use difitsj device ..advanced telecommunication and data transmitted,systet the installation maintenance and repair of which , normally not be necessary to involve , professional ent in the qualifications , profesionah Engineering ,line workers ,workers assistant , administration staff , qualicafition discipline of electric ,the repair workers of electrical electronics components v.
- workers will undertake task such lamp , replacement cleaning of lense paint post and alignment of signal a three grouo assisted worker..
Task of the electrical the electronics section.
- managemt supervision and control aspect related to electrical and electronics.
- management and control of personnel material Soares and tools ..
- keeping if record all activities and inventory control .
- budgeting for new installation maintenance.
- repair as well as controlling such budgets .
- installation maint and repair of all budge..
- installatt maintenat repair simple controller .
- management supervision and control of installation and maintenance..
- contract undertaker by private contactor ,
- inspection of installation during variouse stage of completion and final acceptance on contract ..completion .
- investigation into new development in the discipline of signalisatiin .
- providing advice to traffic engineering on the capabilities and limitation of

traffic signal ,
- planning and implementation and upgrading programmes developing procedure ,
- for establishing maintenance under priority ..
* Control signaj installatt the utisatuin of area traffic ,system complexity traffic pattern well as skill levej of available personal ,levej of two authorities even if they control junction ..
- in terms of work hours per signalissd junctt or crossing the staffing levels .means the ..
That a person work hours per annum)1760 of no × level staffing..
* Appoint consulting engineers contractor ..
* Traffic engineering discipt manager ,professiot traffic engit..
- professy traffic engineering technot and technicit.
- electronics and electrical engineering.
- traffic engineering administrative staff.
- traffic foremen .qualified electrician , line workers ...
- traffic bsignaj ,road authority 299 signaj installation signaj ,and employ the full comolent engineers ..
* Operate with each other form a combit traffic signal division with of staff discussy above large road .
- operate and provide combine division the purpose ..
Where it is not possible to combine resource road controlling 59 signaj,less may utilise qualicafition .
- levet maintence authority ..
Road authorities controlling between 59 and 299 signal installation should emplemt measure that would ..

...

- implementating measure .
* Education and technology transfer : continue Education transfer of skills and knowledge to personal importance to ensure efficient and safe signaj operationel and allow personnel to of , ,,road authority must be aware of the levejs and skill necesst to perform the broad range of function requirements and the consequences of not provide the required .
- installation of traffic signals requirements a .
- signify amount of planning and design by skilled .
- design is high compared with coat ..
- warranty for the installation of signal minimum requirements..
-the traffic signal meet the minimum quee length warrent .
- the investigation of signal site and installation of traffic signal requirements the following tasks:
*Candidate site identification , warranty study ,

Signak design .
- signal installation
* Commissioning ,the road authority phase project ..
- checklist given in to this .
* Can be used for
- checking aignN design ..
- approving of traffic signals the approving of traffic signal the checklist bshould be signed by responsible vrefister professional .. engineering or technilist of the road authority
*
* Candidate location for the installation of traffic signal can identified by means of variety of methods .many locations are identified ..
- makers traffic engineering and techt in the employment of a road authorizay can also. Contribt in this regard
..- the quee length warrent used for justify identification observat over a short period of time during peak .hours at a junction or a pedestrian crossing would .
- indicate the presence of long queues of vehicle ..
- a site should initially be inspected ..
Establish whether it is like ..
- candidate site for signalisatiin has been identified a study should undertake to establish whether the installation of traffic signal would be warranted accordt to ..the study must start ..

* Risk mat traffic signals : the availability of knowledge an skilled professionals and technicians ..
Minimum staff ..
- differentit is made
- by appoint consulting engineers contractor , sufficient number traffic signak operation warrant the employ such range .
- trafft ent professional.. support personnel such computer programmer case ,design operator and admnistrivsv specialists training ,ent technologie should be received .
- specialist training ..traffic ..
- responsible for functionalite .
- managemt and control of the traffic signak , department or divisiit ..
- next step in the warrentvstudy us to establish whether no viable and feasible alternative solution.
- other than trafft signaj is avait .
- implementating ..-
- finaj step in the study is to undertake a quee length study .will be met a traffic signaj installation would be warranted if the site passes this final test ..
- when traffic signak is warrant the site can be placed on lriot list untik
...

-traffic signal has been warranted at a junction or crossing the design of the signal can proceed ,traffic studies should be undertake the site must survey contract documents specifications ,
Requirements contract documents undertake the work ..
-a proper land survey should be made of site showing LANs survey should be made of site ..property boundaries and fences .
- carriage ways kerbs shoulder ,island median existing road marking ,paves side walks driveways drainage structure ,plant and vegetation location ,size and spread size larger tree, ent service electricity water sanitation roadside, furniture , telephone biitg training walls guar raik and logg poles ..
- any other structure such as bridges retaining ,walls ,fikks and cuts ..
- important that attention should possible geometric improvement of a junction during the design phase given auxiliary particut rigth .turn lanes ,but also possiy turned straight through is required..
- the site regularly visited inspected design stage ensure v .
- inadequate space for traffic signak placemt
.distance to adjact traffic signal site ..
- location of any nearby emergency services that requires priority most appropriate location for the contrikkerv.
- condition of road pavemt for installation of look detector .source of power...- parking space for signaj maintence vehicle...-
- proposed design discussed ..
* Design plan would :
-Junction or crossing design showing the geometric design road sign and marking...- traffic signal layout plan showing the locatt of traffic signal faces signal post overhead ,gantries of antivers loop detector and the controller,
- duct diagram ,indicating the position ducts ..draw boxes .
- existing engineering service plan,indicating which service have to relocated .
- traffic signal timing and phasing diagrams ..
- sucessdt signal installation depends on effective supervisor and control during installation ,high degree of supervist is required to ensure that the signal installed according to specific:
Installation done by the authority ..

* Before commenct with installatt the contractor ,
The typical installation sequence for traffic signal installation .
- civil engineering work .,underground ,footing ,cable earthing and wiring ,detector look ,above ,
- signak posf and ovegead installatt.
- traffic signak head.
- electrical wiring and conduit .
- cabinet and control equt .
- electrician connection .

- testing installed signal ..
* Particut attention must also ..traffic accomodat of trat ,trafft signal faces should control maintet ,traffic signal face , liability claim resulting from accidents ....
- of the progress installatt of the signaj .
- any delay must ...any change initisj design property ..
- traffic sign : commissioner: before signsn finally commissioner it imperative that the installation property checked and inspected and traffic signaj operation .
- during this check all signaj plan should be test .
Once been ascertained..
- not as replacement for the contract specifications.
- and suppliers ,the checklist should ..

-***1.4.1.2.42.. overview :the foundation course subject..**

- traffic system management , municipality , public sector manage ,road traffic management ,
Selective traffic law enforcement..
***Selective traffic enforcem**ent,@ ,,
Emphasising RSA : RSA aspect 1996 constitution and the principles of constitution liability and justification vdefensr ,criminsj concept lability conceit law and the variouse division be emphases ,intention the difference between mistake of law fact sinne triaj aspect .Pre trial and methods of securing attendance of accused in court an topics ..
* Student will exposed law relevant the subject ..
Specific offence in terms of road .
- traffic legislation definition and legaj meaning of the following term driver motor vehicle driving a motor ,vehicle without a license speeding implicatt type offences in the event an accident reckless ..
- or negligent driving under the influence of intoxication motor ,, while concentration blood is more than concentrate ..
Exposed to other offence in terms of national road traffic act 1996 act of 1996 act no 93 and additional .
- offences in term of the criminal procedure act 1977 act n 52 defesr or obstructing the course ,justice contempt court oerjurt subordination and perjury conflicting statement under oath , corruption ..
.law evidence important concept importa .law of evidence type of evidence issue relevant to ...
*- traffic criminology . Department of safety and security management..
- the object is to focus on the inappropriate handling of road traffic offence as well .
- undertake own gain ..
+ Misconduct the emphasis is also in the development .and implementating of measure to limits ..

- traffic system management : an introduction traffic to the traffic fraternity role players and their internal relationship in the Engineering enforcement system ,such registration licensing policing and accident detailed attention.at
- tactical and operational levej at strategic level . identification ..road traffic disaster management structure and implementating totaj
-
...

-**1*.4.1.2.43.* overview : security pratice school lowv**
Introduction to security at supervisory levej introduction to basis security concepts implementating of administrative procedure physical procedure in workplace
introduction to access control ,inspection Patrik and observations technologie .
Control of access to public premise and vehicle act 53 9f 1985..
- criminal investigation : general irientay to criminsj investigat include the right,,
-overview : law including security with criminsj justice system discussion on selected crimes such injuria , the relate , housebreaking ,fraude damage injuries property ..
Private industry regulation act 56 act 2991: arm and ammunition act 75 of 1969 and fire act 75 of 1969 and firearms control act 69 of 2009 explosive act 26 of evry drivers..
* Criminsj investigation of the crime scene inckudung scene search for evidence rwiten statement format requirements , if good giving evidence the paterne if criminsj court proceesing and giving evidence in court role intelligence .
& Basic fire prevention and safety .basic fire prevet and safety controle and extinguisher automatic sprinkler system ..
-*security technology : introduxtiob technological technical such alarm , surveillance ,CCTV camera detector contrik the objective this module is this equipy supervision with knowledge and skills technique and interpretation infirmat gathered or detected variouse security objective to apply basic principles technoy and security system such as utilisation of the security ,,

..
Module overview the criminsj justice process learner . background information in criminsj to equi.law necessary skill person when using arresting person for seizing article ,module learner ,, court present such evident in a criminsj court in such ..
- investigation terminology the role of investigate with the corporate envit established and investigate report value witnesses in a investigat basic

interviy skikj cooroort ,philosiy ...
. Basic interview skills corporate fraud and cases housebreaking and preventt of corruption..
- industrial security distinguished variouse philosophies and concepts and requirements of a propriety security application functy if security as business discipline position function developing structural framework for emergency planning and managing of the guardians security awareness creation and maintenance ..
- security pratice : security risk asset crime risk assessment crime related rush measures and analyse crime risk in organisations risk contrik physical and organisat ekemint of crime relate risk reductt of crime risk insurance ..
- *security contingency planning .
The meaning and multidisciplinary natur of contingency planing typicaj crime related emergency threatening an organisation fraud ..
-* advanced corporate investigat : introduction to corporate investigation management of internal corporate investigat corporate intelliy ,prevention theory principal security analyse system penatratiob

_____
* Training of security service provider ..psira ..
Purpose regulation interpretation..
- private security industry regulatory accreditation.
- general function authority
- accreditation if skikj development ...- registration assessor moderator .
- learning ..

Training requirements.
Categories , application ,guard close protection ,security electronics ,control operator ,lockmist ,private investigator v,dig handler ,national ker ,armed Ribery ,advisor , managed ,training instructor ,moderatut
...

..- **1*.4.1.2.43..***qualicafition in relation labour.criteria , assessor.
* Analyse the pension funds act as it applies to the administration of retirement funds .
-describe function of mediating bodies in labour relation .
- apply Cass law and judicial precedents to labour relations issue.
- apply the arbitration act in dispute resolution .
- apply the provisions of extension of security of tenure act ,62 of 1996 Esta .
- conduct a labour conciliation process .
- conduct Pre concilloation by telephone in term in terms of the Ccma rules ..
- conduct referrals in labour conciliation ,considerar a condinat application .

- demonstrate apply an understanding of the basic conditions of employment act ,demonstrate apply Ccma ,relation labour act respect to collective agreements levejk ,established basic princit of evidence in mediation .
- identerpret and apply employ equity legist to industry charter .
- interpret and apply provision of the labour relations act relating to organisation rights.
- interpretation unfair labour practice legislat in dispute resolution written and conduct an arbitration process .
- write arbitrat award .
- analyse and interpret unfair dismissal in dispute resolution .
- conduct a disciplinary heart .
- consider advisors award in labour dispute..
- consider rescisst and variations applications ..
- describ and apply an underst of the interpretation act 33 of 1956 interpretation of statutes act ..
+ Manage and conduct an in limine hearing ..
- access process adapt Nd use data from wide range text ..
- apply principle of dispute managemy in labour relat .
- conduct negotiatt in labour mediatt .
- demonstrate an understanding of Rs legal framework .
- use communication technique efficuet effects.
- conduct interpersonal management .
- apply efficient time manat to sorh of a department .
- apply the compensation for occupational injury and disease AC in mediatt.
- apply the occupation health safety act and the mine hey Nd safety act in mediatb..
- apply the promotion of access to infot act mediatt.
- apply the protected disclosure act medhsgion .
- apply unemplt insurance legislat in mediation .
- conceit dispute in relat to training legislay .
- consideray dispute .demonstrate understand transformative .describ promotion of administrative justice actv and principle of administration .
- drafted employ .
- operate the case management process .
- apply labour prevention approach..
- apply solving technit to make decission in multidl, interpretation unfair dismissal term of labour ..

* National diploma relation labour resolution , national dispute legislatt and humanity
...

*__1.*__***4.1.2.44..*****__Overview: skill development . Legislation ,sector training authority , seta manufacture relate merseta , Teta ..__**

Education edpseta ,
Regulation work education technologie ..
- introduction :merseta code objective
Use measure checking ,firming cutting ,marking and satenibf tools and tools aids ..
- measuring and marking tools ,1,0 mm accumulative ,dimy tolerance and 2° angular tolerance
- checking tools : forming ,cutting and marking tools ,correct application akk safety aspect adhered to ..maintain measuring checking cutting is hand tools applicable to the trade all safety aspect adhered to.
- all tools and equipment are clean after use ...* Workshop tools : use fixed and portable drilling machines .
- correct speeds and feeds to be used .
- holes to be within, 1,0 mm of centre .
- correct cutting compound to be used ..
- use fixed and portable grinding machine including replacing setting trying and ringing wheels all prescribed safety standard applied ..
* Wheel must material recall the physical properties and characteristics metak ,
- Minit of 15 ayesti with at least 80% pass ,identify the follt conducting with respect to conductivity current carrying capacity and correct accordt to sabs 0142.
- identify and use the folt insulating materials with respect to resistivity .
- temperatture and hydroscopic.quality pvs glass fivt resins tales varnishes epoxy compound and PVC compound correct according to the relevant sabs code and. Manufacture specifications..

_____
* Module code objet criteria drawing sketches .
* Recall symbols and abbreviations used in electrical circuits for schemat and wiring diaht connection schedules ,cable layout and single line drawing a test of minimum ,
25 question to be set with an 80% pass mark in accory to recognised code of practice .
- recall symbol and abbrevy as used in Engineering drawings a test of minimum 25 question to set with an 89% pas marks ..
- recall symbols and abret pertaining to electronics circuit diagram 100% correct accordt industry ..
- interpret electrical drawing
- correct accordt to an acceptable code of practice ..
- interpret electronic circuit diagram
- explanation of drawing to be 100% functionalite correct ,
- complile material list from electrical ei and electronics drawu . correct according to given drawing.
- marking off ..
- mark off project applicable to the trade ..
- all angle to withing 39+- minute ..

- all dimy to withing +- 0,25 mm .
- mark off projects for manufat using all standard marking .
- off technique and tools .
- punch hole centre 100% correct ,Ll diment to be with 0,25 mm
- fabricate a project applicable to the trade ,
- all angle to the within 30+& minute ..
- all diment to withing +& 0,25 mm ..

.* Charoen chisels cutting angle is correct and mushroom in the chisel head ,sharpen drills ,angles according to tables and application .
- dress screwdriver.
- all safety aspects adhered to .
- screwdrt to functionality
- sharpen ...- correct included angles according to application arc wet ..
- identify and set AC ,and or DC weldit machines equimy including starting up and shutting down procedure .
- correct according to manucture .
All safety aspect ..
- differential between arc weldt consumat correct to manufacture soecifit..
* Prepare material for arc welt : correct accordt to compound welding procedure and pratises with regard to weld joint preparai voltage , amperagy ,and welding consumer..
* Tack and arc weld work piece incidental using manual metal arc weldt technique ..correct accordt to company quality control procedure ..
- all safety aspect adhered .
- identify and up oxygen .fuel gas weli ligth up gas pressure and shut down procedure ..
- all safety aspect adhered to selection .
- differentiable gaz welding consumatv.correct according to manut specification .
- prepare material for gas welding .
- correct according to compagt gas weldt procedure with regard to join preparau include gas welding consumat.
Gas wels work ..
- correct according to compagny quantity contrik procedure .
- gas cutting and heating ..
- identify and assemble gas cutting and geat equipment .
- select nozzles and gas pressure for cutting and heat different matert of various thucknt ,100% correct ..
* Basic liftu technique : recall overhead crane signals , 100% correct accordait to recognise code of practice ..
- used the follot equipment .
- chain block ,2 ton max ,
- shackles : 2 tin max .
- chain slings : 2,5 tin max ..
- wire slings : 20 mm diameter ..

- no links in wire rope sling and chain slings ..no damages to equipment.
_____.
* Electrical measuring ..
Selected and connected the follt pannel meters and interpret the .reasit voltmeter ,ammeter, energy meter (kWh) .
- Meyer selected and connected ..
* Gives correct reading on meter : electrical testing instruments portable : ..
- identify and use the fit instrumy for safety and fault as used for electrical syst up to 759 volts : voltage tester ,multimeter ,insulation tester , oscilloscope,earth leakay polarity tester ,phase rotation tester and signak generator ,correct test instrument selected for the application .evaluation of test readings.
-* module code objective criteria soft solder ,prepare and solder the fou: hard copper : soft copper joint to be selected and mechanically sound ,soldering component into a printer circuit board ..dry joins ..
- no damagt to component tracks or printed circuit boards ..no solder bridges .- solder geigtg not exceed 1 mm.
- fault fit : fault find on the follt : controle panels ,distribut ,boards ,contractors ,relays ,insulator ,fuse holders and motor control gears ,
* All safety ..correct test instrument is used ,specify as per draw is adhered to ,assemblies are correct .
- all fait are corrected ..
- fault find on the follt equipment ..
- control panels ...boards contractor and relays insulators ..
: fuse and holders .
AC heavy current motor control equipment and pratical application of fault findt technique ,open circuit ,short circuit ,under voltage Reay faults ,retaining fault, single phase faults ,mechaint faults ,
- specific fault applicable to panels and the diagnoy of the specif fault symptom of each panel result of its purpose and composition .
- all safety aspects must be adhered ,
- current testing instry must be used.
- sorcificat as drawing must be adhered to all mount must be correct ..
- all fault must be peemt safety and neatly ..
- module code conductors : current carrying capacitor accordance length and cross section area ,correct according to sabs 0142 .
Joint conductor by the following methods : crimping ,soldering ,correct size ferrukt to be used,correct crimpit tools to be used ,join correct according ,,.
- module cables : make off and join multi and single core standard PVC ,armoied cable up to 16 mm.sqr ,4 core ,1209 volt insulau ..
- glands ,ferrules and lugs used to correct according to manufat specificatt join to be electrically and met sound and according to manufactt specifications..

-identify rating of cables by current voltage and temperature .correct

according .
- recakk method of storing cables correct according to , sabs ..
- terminate pvx cable (up to 1299 volts insulation) for entry into cable end box using mechanic and compression.
- correct according to sabs
Identify XLPS cables , 100% correct ,electrical equit

Maintenance repair and test the following equipment : contrik panels ,distribut boards ,contractor ,relays ,switch gears ,circuit breaker ,time ,isolator fuse holders contrik gears ,electrical machine protective device and ligthu systems ,

* Module code objectt criteria wiring , design : design and the following with reference to the applicable drawing ,panels ,start ,motors ,motors gears ,electrical distrt ,system ,protective ,system lighting system incly dischary and fkuoret lamps ,.* All safety stayv..
- all circuit function according to specificatt.
-mount wire and connect the folt switch boards ,distribut boards ,motors controls isolator, electrical eqt ,
- safety standard to be adhered ,all circuit function according to specification.
- wiring correct according to sabs :
Introduction to wire ways includes the follt ,
- racks trunking flexible conduit corrected according..

*AC Machines : design and wire control and circuit to which the follot single phase machine can be connected take into considerat protect and safety .
- capacitor start motor ,forward and reverse ,capacitor start ,capacitor run motor ,forward and reverse ..
- phase rotatt 100% correct ..design and wire the follot main circuit ti which phase sqyirek cafe induction motor cab be connet take consideration protection and ..
Safety equipment that must be used ..
- direct on line forwat and reverse automatic start ,delta ,auto transformer ,constant torque motor ,2 speed ..
- correct according ..
* Module object criteria design and wiring follow contrik and main circuit to which a tree the slip ring induction motor cab be connected ..
* Hand and automatic control resistance starter or current limited started starter ,take into considert protectt and safety equit that must be ..
- phase rotation 199% correct .
- correct according to sabs ,connect three phase and three single phase transft in varut combinat to obtain various voltage ,phase rotatt 100% ..
Before commissioning test follot AC machit electrically and met..
- capaciti start motor ,capacitor start motor , capacitor @, 3 phase sqyirek cafe induction motor ,3 phase slipn ring motor..

* Transformers ,auto transformer ,
- correct according to sabs 0142 test procedures , all connections electrically and mechanically sound ,
- capacitor start motor ,caoacitirv run ,3 phase ..

- transformers ,all fault must repaired permently and to manufactt..
- obset on fault symptom on AC pandk and diagnostt composiy.

- DC machines : connect test and fault find the follot DC machines ..series machine.
Shunt motor ,compound ,rotation 100%,correct ,coorext accord sabs ..

_____
* Module code object criteria electronic:
Electronic compot : resistors ,wire wound up to 10 watts ,carbon and metal oxides @ watt caoacitirv,electrolytics and ceramic diodes ,
-:

- thyristor ,100% correct to manufactt specificat , constructy solder and fault find the following circuit bib,stable multi vibrator , elementary ,SCR speed contrik ,all circuit to operate functionally correct ..
- Tracey oscilloscope up to 29 MHz to ,.wave form DC ,AC,average peak values , frequet ,RMS values 100% ,,
* Programs and use P.L.C systet according to compagt requirements and manufacture specifications ...
.** Overview: theotett training a four subject pass is required to attemp trade test ,mathematy and the relevant trade theory subject compuly future chouse empolyer apprentice college in order to obtain four subject requirement ,plus two relevant subject subject certificate should be allretice have qualitthan ptescri in the schedule ensured ..
On job exoey and indepet work ..: on the job exoey and independent work coverage 89 % pratical module to ensure as wide possible field ..

_____
Overview ,:
Manufacture process ,manufacture fundamental machine ,, processing
Claim invention components

...
*__1__***__.4.1.2.45.__ Overview: engineering.**
__school practice college pratice university pratice orientation skill Learners job ..__
__- key: school r__esource officer job description to provide security and develop safe plan for our school the school resource officers responsibility include developing the best safety procedure for potentt thread in the school

conducting drills with students and staff breaking up figth and escalinf aggression between students and betwet students and teachers the school resource officers is the main security resource of the school and is certified police officer. ..
- school resource officer resoonsiblitie ; breaking up figth and arguments and assisting all parties to talk through their difference .
- detaini or arresting student who are breaking the law in regards to drugs bringing weapons to school or marking threat the school.
- demanding students who commit lassed offenses to the principi or vice princit.
- conducting physical search of students property if they are suspected of breaking the law ensuring the school .
- patrolling the school ground ,ensuring overall safety viewing video and security monitors and watchit for Stanger or suspict activity.
- supervising metal detector and soecisj events and directing foot auto traffic if necessary.
- protecting the school and student against theft drug and damage ,and asssrat in medical emert .
- working with guidance counselors and support staff to student when referrals to service agencies necesst or ..necessary conflic ..
* School resource officer requirements :
- a certification from a police academy with advanced yrat in school setting ..
* Job description;
- duties and responsibilities:
- general : districts should reflect on their unique situation to determine which of the follt objective best meet their need : some or all may apply the Sri..
- foster education programs ,activities to increasy each study knowledge of and respect for law and the function of law enforcement.
-attend extra curricular,activity held at the district school within the city when feasible and promote a positive relat betwet students and law enforcement official ..
- understanding school policies regarding how to distinguy disciplinary infraction to handler by school officials versus criminal activi that warrants Sri involmenyb..
- review enfort and investigat technique at local school and work with district personnel to provide in service trainu to staff with regard to criss managemenyb and school security..
- work with the district personnel advise concerning and traffic safety on and around the school campuses..
- act swiftly and cooperatively when responsdit to disruption and criminsj offensr at school or school ground such as disorderly ,conduct by trespasser the passion and or use of weapons in campuses the possesst Sala ,distribut or use of alcohol a controllt substance rioting or dangeroy ,demonstration seriousd act of vandalism ..
- make report of criminal offenses as departmy regulation as warranted and

investigate such occur at school ..
- provide assistance to other officer the departt or other Las enfort agencies in their inestigatt of criminal offence which are alleged to occur off campus but may be related to school activities .
- familiarise themselves with the many issues confront student .alcgikk ..
- work collaboratively with district ..from other jurit with the county and county probation and health set to create safe and drug free school and promote health youth det.
-providd direct intervention to children who are victim ,witness or perpetrators of violent crime ..
- participate in program evaluation by providing data and assisting with analyse and recommended through partenship meeting .provide assistance in the devet of a safe school plan and crisis .preparadenss guidelines for school ..
- define safety and security meast as need with the school and assist with implementating the service performed by am not intended to supplat those provide by exists district security personnel ..
- handle the primary responsitbresounse Patrik office when approprt .established .availy ..provide safe health and secure envit on campus and in the immedy .proximy ..
- give educational present to student body ,faculty and parent while being avait to student proximity campus .
- provide routines marked police car Patrik and door Patrik during the most critical .
- provide intelligent on lawc enfort and school official relative to gang or drug activity enfot..
- give educational presentatt to student body ,faculty , and other school based groupsvrelative to law the role law et and other apply subject ..
- serve as a source for a,b,c,d and depart safety progratvspeciskn in the age appropriate b, curriculum b..
- Training. school admnistor , drug education and juvenikk awareness and instruction in developing age .appript circuit .
-;encourage input from the school and community to inform ongoing policies that training safe and inclusive school ent .
- train developm personnel on the role and school issue important for officer ..
- be a liason for school police and probation and the community to keep all all informed of activities of other who may be risk inclined cause..
- commit crimes : assist police investigator with informay that will help solve case.
- help school staff in lessening campus tension and provide assust to campus supervisor as needy.
- consider diversion opporty for youth rather than arrest when appropriate.
- communicate and coirdint with the Patrik and investigation unit with the probation. Ddpartb..used discretion handliy confident material and information ,use the resource provided the preventt obsefvat ,intsrcet

investigate and report of unlawfft act ..
- as need attend district activity outside regular duty hours deoartmt shakk use it best effort to have request service by outside regular duty hours maner incur overtt for district overtt basis as requy by the district the understand department .is genert requirements to pay officer at least one half time over time ..
- co-ordinate all activit with principals and staff members connscwrt and seek permission advice and guidance prior to enacting any program with the school submit activity report to the service Sergent the support service commander will submit an activity report to the police chief at the end each school years ..grow profest through study and participation in profesionah activities including recommend straining ..
- to develop procedure to handle campus safety issue ..
- to establit and follot written procedure for referrt police involvement .
- to train district .staff in accordance with the procedure outlined herein as well existing district police involving student health and safety ..
- defining the role of school based police officers : justice static law et managemi and admistrativs ..
- the prevalence the price police in school ,role of law ent in public school safety , survey student three .. .

*__1.4.1.2.46.Overview : Community policing advise : duty station organizat unit ..indicative__ minimum gross annual departmt of peace operations.
- qualicafition: education ' advanced university degree master degree or equivalent in law social criminal justice related field ,a combinat of a bachelor degree and extensive exit in police operau matter including community oriented policing may be accepted in list the advanced degree graduation from certified police academy or other law et traing faculty is required ...
- key work expert : a minimy national police administration level rank of superintended l colonej other service eayivat or high rank is required ,expert in community orientated both policy making and impletation is required oeacekeey .other un ..
- qualicafition :
Educator advanced university degree master degree ,
Institute : adjoin chirg police. ..

...

-*__1.4.1.2.46..Overview: technical knowledge,__
__-Abstract resoning :__
__- analytical abilities .__
__- attention to de__tail .

- numeracial .
- verbal ability .
- data ..
Electrical ent work lrimat on the design an developmt of electrical system and equipment they apply the lrinciply of physics related to electricity electromagnetic ,and electronics for processing information ,transmitting energy ,solving problems and testing equipment Kong with possessing good knot on these topics the eni aksi need congnitivd competence reasoning numeraciak ability ,data analyst ,attenty data analysis attention to detail verbal any ..
- test Candida. ,skukj power circuit theory
*Abstract : assememt of learning process is an essential part of the educational pratice on the one hand it Llowe evaluation the knowion there result can used to make decission for improvement of the decission for improvt of the Education practices the success of e learning practice .the success of e learning has allowed the success emergency of new computer bass of new tools designed to enht of the educat information technology applied to Education and particuky the use of internet allow the creation of interactive self ast test that use motivative student learning task and check their progress previously to definelty examined computer based ..
-:evaluation knowly student ..
-:* formative and Summative assessment .
-;formative assessment is a systemay and continuous activity during the learning process aims to provide feedback during .. assessessment .to Providence , emphasising .....teacher on carrier v.. asssessment give summarise the levej of competence student the teach plays the role coach and f achievement point .. learning processes means of a parricuy grade or Summative assessment is usually based .. assessment
..
- asst perform role of judge student achiet at give period taking account the discussy above that formative ..is generally favour over Summative asy it give students an opportunity to have an idea about their streny and weakness at they proceed teacher .student progress Cass studies far for mer incidentally knowledge ..
* Key information and communication technology ICT in university College increase fact learn allow emergency new computer base tools particularly design to enhance .process nevertheles on line assessessment tools are gradually activity ..
- the papoer discussed on the advantage and disadvantage that computer evaluation offer against conventional papoers bass agains ..method software to used in her Education course are also examined in the manuscript and comparative analyse if application to conduct on line and off line exam is carried out with particular atteny to the available type of to available of incorporation multimedt content to exam .
- possibility of creation and Mai a bankiy questions , available test generation option ,number of questions ,number time number attano

scoring ability provide ..
- computer based - based exam versus traditional assessessment methods advantage and disadvantage..

Spincrease rate to have student ,pratical benefits ..
Automatic marking beedbat immediately vto student ,the largest cladd size vinteractive activiti multimedt tools can be incorporated to the assessessment process ..imparty in the results teacher interpretation and legibility ,time effectt advantage of student increase and skill used of ICT are but credited numerouse advantage ,on line ..
- disadvantages v include ..
- possible authoring and security faillure .
- additional work for teacher generate board bank question .
- possible technical faillure in the server computer networking or softway perfort the test .
- technical diffiy to automatically mark certain type of exam ,question .
Eny problem.
- the use of objective online assessessment tools can have studei approaches to learning by encourage narri reproduction rather order cognition abilities of ,synthesise and evaluation .
- form the above it can concluded that computer assisted benefit and lecture ..model is benefy for .student and lecture it serve to motive use ..
- ICT the say time they can provided .with greater flexibility and time .
Lecture improve competence ICT at the same time that they can provide with grather .. conduct their learning in case computer in case computer base or traditional must must care planned to make it truly tecbhczj ..computers..
- comparative analyse of software to conduct computer test :
- at present is abundant software to generated and admnister computer base exam most ..e leave platform .moodke web CT dokeod ,,module to prepare and conduct on line .. specialized design design to generated conduit on line and offline test developy ,,selected application conduct computer based test .. create ,published in web grade ..build.
...

-:sharing them with students and managing grade ...
-pro profs is advanced free tool to create test qyizze and exam power qyize point ..
-:where power point presentation and published them adob qyestv..
- and manage asst test ,quizzes and exams both in line and printed ...question tools instantly available asssessment on a wide range topics plus the opportunity to create your own online test ...- create and published on line flash based ayize surveys multidedua ..
- commercial software for of line assessessment ..

- auuzstar teacher allow creating disseminating and automatically grading online quizzes for students ..
- this sift allows creating database of qurstt and delivery on line off line test generator is professional ..
- this computer took allow creating question ..different web application design to conduct on line test student question and to be installed and apoerated in a computer the advantage ..computer a computer advantage of introducing the web is that teacher can it from computer at home or campuses but had disvanyage ..
- a comparative analyse of application to conduct on line exam has bet carried with particular attention vti the available incorporated media creating manage a bank of questions v test generation option qurlestion contrik time number attemps scoring option the ability to provide feedy to the students their answer among the question ...
-;absae fill in the blanks matching drop image video link ,line survey ...-
proper qyize mark of line choice boxes true false fikk in the blanks matching shirt text .easy image tables animation equation links ,yes ......-
-:creation of interactive self assessment test that cab learning task check their exam...
- acknowledge: financial support for researdgv..
Implementating learning btechokigur ,,
-:computer base assessment assisted ..
...

- **1*.4.1.2.48..*overview: circular v 5 years over years allow learner concek question curriculum in support electrical engineering bachelor of science in engineering ekectric in Engineering b.. Degree in electrical et activity** and discuoly student able to selected degree soeciat control ,instrumental ,difitsj system ,electronics nuckeay ,engi ,power electronics and machine, power Nd energy systet sugnJ ,,signsk and image oricess and telecot and RF micriway systeb .....
- ent drawing
,physic for Engineering wearing , culture identy globalisation in Frica ,computer science ,,
- physic b for Engineering.
- pratical training .
- analogue electronics ..
- embed system .
- professional communicatt for electrical et ..
- vector calculus for Engineering..
- introduction to Engineering mechanics ..
- introduction power engineering
- signak and system .
- linear and des for Engineering.
- project management.

- electromagnetic for Engineering..

_____
Electronics devices and circuit .
- energy conversion .
- signal system II.---
_ communication network engineer contrik system engineering...-
engineering design electrical engineering ..
- power system engineering b..
- law for Engineering ..
,- professy communication studies ..
- new venture plNig .
- industrial ecology .
- final years project ..
- mobiles briadbnda ..
- power distribution transmit netwitt..
- process contrik instrumy ..
- digital signaj processing ..
- micriway eny.
- communication eny ..
+ Power system analyse ..
- electdicK machine .
- microwave device circuit ...-
- introduction to medicaj image image processing...
_ introduction to electronics eny.
- mathemai is for engiy ..
- physic ..
- physic engineering...-
- professy communication for engiy for electrical t..
- electronics device and devices and circuit ..
- introduction to dngiy mechaincs .
..

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..

-*-**1*.4.1.2.49.* overview: introduction to electronics engineering : introduction scope electronics.**
- introduction to content method and mode thinking a futhute develop approatvstudent design process topics include .
- current ,voltage and power resistor ,capacitor ,capacitor sensor diode bvipolaire junction bjt circuit metak ixyde semi conductor field effect transiy .moseft digitsj anslog integrated circuit operationel amplify circuit ,mixed signaj integrated circuit the ..
Circuit..89 % lab tutorial attandance 100% ...
-* introduction to electrical engineering.

Course :concept power generation transmission , distribution neckwear energy and renewable power appliance and basic networt a futhute develop .design process topics power generation transmission ,district and utizatuin DC network inductance and capacitance circuit transients ...
* Electromechanical : elect enyDC network DC circuit ,series Nd parallel connection of resistance and start delta transformation voltage and current source ,kirchoit law DC network ,theorem thevenin Norton etc. Fundamet if AC including ,generation conpet of wave ,frequence angular velocity phase frequency angular velocity RMS etc average angular circuit circuit AC resistance , inductance ,l caoacitat ,concept of reactance and impedance phasor single phase AC series and parallel circuit ,circuit power ,apparent power Ooarsnf power factor ,magnetic circuit include definition magnetic circuit ,simple and magnetic circuit simple and composite magnetic circuit calculate ,hysteris ,cots loss sinusoidaj excitat of magnetic ,,circuit and induced voltage single phase transformers include operation EMF ,eauatt and transformation ratio ,no load and on load ,phasor diagrabb ,with lagging and leading load exact BD aoorixit equicat circuit open short circuit test losses and efficiency voltage regulation .. engineering

_____
*

1*.4.1.2.42=50..*Introduction to electronics engineering .:
- basic semiconductor physic such as charged particles and Bohr atomic model for silicon .rectifier diodes and special purpose diodes such a zsner and led , and appreciate diode are use .
Electronics circuitry such as power supplies the students will have supplied a solid grounding bipolar junction transistor and hoe are used in switching and amplification application ,Fer wikj simmilark ...digitsj electronics ,logic gate bollean logic developm as part ..cmis will . engineering scientific knot ...
Design projects relate .

_____
*Understanding the basic concept to three phase AC power : generation ,voltage,current power calculation ,conception balanced and unbalanced system , measurements of active power by two wattmeter methods conception simple and composite magnetics circuit magnetic hysteris ,basic princit of operationel of electric machines transform material construction operating characteristics modeling and perfort analyse DC generator ,modelling ,performance modelisd ,generar DC motor bkdc ,single transfory ..100% ..

_____

*Analogue electronics design which which analyse electronics design circuit components electronics components B .
Topics : diode ,basic diode circuit ,zener diode ,voltage regulator circuit ideal diode modej piece wise linear diode ,models rectified circuit .
- wave shipping circuit linear small signal equivalent circuit bipolar junction

transistor .
- current and voltage relation , Ebers modej common emitter characterisy load ,line analysis of a common emitter , amplification pnl bipolaiy juncty ,transistor large signaj DC ,circuit modej large signals DC , analizing bjt circuit smakj signaj circuit ...- common emitter
amplifiers ,emitter ,followed field amolifiy ,bias circuit small signaj ,
- amplifier specification and externat characterit and characters amplified conceit supplies ,efficiency operational amplied idea operationel amplified non inverting ,Molofier design of sinkme ,amolifiy ,imperfecty in the linear range of operation non linear limitation DC ,imperfey .diffentiaj and instrumentat amplifier integrator and differentiator whrastonrs ,bridge frequency response active filtre RLC circuit and their steady state analysis ,frequet response if singkt pole RLC circuit idea filter frequet characteristics ..filter ..

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*

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...

*__1.*__***4.1.2.51..*****__overview: this strong fout in embedded systems by introducing them to digital syst fundamt .including ..: information representation Boolean algebra,logic gate behavt combinay and sequential digital circt digital building blocks and algorithmc state machine c programming with a focus on microcontro__ller application basic microcint,,
-:usage including and introduction to computer archit ,general purpose input / output ,analogue to digital convertor and basic timer ..

____
* Signals and systems ..
Understat linear start and the effect that such systems have on deterministic signal upon completion signals ,completion ,: characteristics and manipulate linear time invariant system in terms of input - output relationst using both time and frequence domay methods concepts signaj representation linear convolution Fourier analy ,sampling of continuous time signals and la place ..

____
*Communication for electrical engineering: ,, requirements vreport in terms of planing organisation and selection of information additional student ..
*Intro to electrical and electronics engineering science students :.
Computer ING Engineering and science knowledge in carrying out analysis Probly solving design components cover design project .
- the electrical engineering components cover DC network, fundamental of AC single phase AC circuit d magnetic circuit single phase

transformer ,understands of DC circuit network step sinusoidal excitation of inductive and capacitiver and wave phasor diagram ,behaviour of ,AC through inductance and capacitance single phase inductance and capacitance single complex power and power factor magnetic electronics engineering component ..electronics circuit , circuitry amplification application learn logic gate Boolean logic will be developed the basic CMOS logic operationel using ..

_____
* Embedded sysy 1 , computer engineering :
- Engineering string founday in embedded systems by introy them digital system fundamental .
- representative Boolean ,algebra ,logic gate behavioy combinational and sequency digital circuit digital building block and alogory state machine ,c promming with focus microcontroller application ,basic microcontroller application basic introducty to computer input out put , ..

_____
.*practical training :
Pratical experimental bexperience culmination in thechnicL report and certificate showing to the satisfat of the head of department evidence of completion of suitable work for .work for minim period six weeks engineering , employment the end the report ....AC power theory three system electrical load machines ..

_____
*Mechatronics :
Aim to develop an advat understand of mechatronics design topics : and bottom ,up design strategic application of electromechanic
system ,system ,sensor ,power electronics and actuator to mechatronics and computing platform ,embedd micro controller and programmable logic controller PLC and case histories in mechatronics design are also .....
---
*__***1.4.1.2.51***__ Electrical engineering design principles ..
Undertake engineering synthesis sub system levej design methodolt and variouse approaches to procedure to exposure to variouse simulation tools is provided to ensure ..
- systematic modelling and measure error analysis are measure introduced and statistics modelling of engineering design is emphasized optimization using both gradient and sift computing methods is introduced as an invaluable tool in modern multi constraint..
- base design and synthesis ..

_____
Electromagnetic engineering.
* Introductythe electrical engineering to mechanism of electromagnetic radiation by antennas and nature of field produces by propagt of plane waves in space in space and in lossy media is student and application models for them transmisst line are constructed models are often use basic transmisst line are constructed these models are often used as basic

elements in design elemy componey simplicatiib ..power ..

_____
*Electronics devices circuit : under power line supplies standard circuit over current feedback Cro bat circuit selection.design regulation series and shiny series and shunt error budget line error .
Folder .low circuit ,low current ,op amp ,para current drain , butterwoy Bessel ,oscili , criteria phase shift iscillay bridge oscimkaty relaxation , oscillator amplifier stability op smo bode plots output characty of opam driving long .
- cable addiy amplifier models ,important impedance amplifier ,class ,a,b,ab efficiet source floating load ground connected load switched mode power supplied buck ,gate driver mixed signaj layouth high speed circuit circuit layouth high speed programm line effect layout..

____
* Energy conversion : fundament of AC electric machine power electronics severaj machine types are ,modern AC machine the feature characteristics and performance synchronous and other modern AC machine the feature and performance each machine type are .. uncontrolled and conyrikked rectifier circuit are introduction topicaj industrial industrial application of AC machine power .electronics ..
---
*Signal system ||
*: developm the understanding of random signal and process in continuous process ,discret time ,probably distribution ,density ,random signskbcakculuf means variable ,moment generation functy transforms random covariance corellarion central Gaussian process random signal spectrum density PSD wiener knichinr theorem entropy function estimation ,filtering if random signal additional understandanding ,of time and frequence domain signaj processing for domain signaj electronics system Carriere wave radio and instrumentation continue electronics carrier wave radio and instrumentat continue time Fourier theory sampled signakband noise through linear complex analyst power calcul function pulse PSD function match modulation ,demodult amplitude modulay double sidebanded ..

_____
* Communication and network engineering..
Aims to develop the understand of computer networking and the internet network edge network core netwot performance metric protocols layers and service models lab topology physical media OSU reference model and tcp / Io reference .. standandar computer networking attack and preventt history of computer and transfory layers : application and transform transport socket programming transport layers service ,
multiplexing ,demultiplexing ,
-connectiob transport transport transport tco ,tco congraty control and performs issues network layer network network ,routing router architecture b.internet protocols routines algorithm routine in ternet

integrated and different service..
- issues error detecty and correcty multiple access links and protocols switched locak area network IEEE 802 family link .. properties signaj noise baseband system formatting textual data ,formatting analogue information source of corruption pulse code modulation detection inyerb,symbols , interfere , equalization band pass modulaty and demodult amplitude ,dmmerguy communication mobile network fundameyb....

_____
* Control system engineering :
Aim to develop understand if open close loop configutat block diagram dynamic dynamic ,system modelling ,transiey response ,stead state error criterion system ..
- stability Roth hurwitzs criterion root locus ,frequency response ,Nyquist ,bids diagrams , Nichols chart..compete lead lag ,circuit minor loops ,feedfoward and three term ,controller sensitive function minimum prototype response controle bilinear methods state variable state space ,robustsr onservatt contrillabit ,stability ..

.____
Embedded system : architecture system ,theory and practice for the design analyse of computer language theory analyse of computer design architecture to hardway description HD programmiy design processing bthr structure an operating system criss compiling toklchains and relevant related contrik protocols and methods for modelkt and simulay of computer system concern using embed operating cross compiling application and using board computer programming and techniques and tools developing gateware and simulating design a mini project simulating imolenting state machine and perfort ..

_____
* Enginering design electrical and computer engineering : assign design problem relevant electrical computer assign problem relevant discipline design protyoe and test sub system this provide insight to undersy the intrudicallyv,using the skikj they have gathered cover teborevioused . Inyrucajj real life ..
*
- power systems engineering: development Engineering power systems network model system work modejs per unit load flow and balanced transform protection principle belectricak load and tarrif ..

*Research project : final years project is an important tackle real ent project that involve the creative application principle .of problem society expected to work project .project involved consultation bguidence of supervisor project involy a problem bdescrib .. developm.
...

t

1*.4.1.2.52..*Overview : Engineering controller and manufacture ,, system module, thermoelectric an .refrigerator cooling system... engineering.,,

tec termo electric cooler

Technical controller product , coefficient of performance cop ..

- thermal design.
- DC vs power supply type PWM..

Comparison of two tec controller .

- lineare vs smps tec controller ..
- Peltier obtain the maximum efficiency when cooking with Peltier elements golden rules ..
- 1). I/ IMAX when dt < 25 k
  I/ IMAX should third (0-0,33 x IMAX)
  2). I/ max when dt > 25: middle third ..
-

3) coefficients of performance ,cop= QC/ Pel...

The cop vs current relationship of Peltier elements. for different DT..

- the optimal operating point of a Peltier elements is when cop is maximum the cop maximum depended strongly temperature difference (St) between the warm and cold at it can cop maximum shift toward higher current when the St is increasy the current should not large than 0,7 time ,Imax because the cop become ,small the Peltier elements is very inefficient..
- thermal design :

Thermal design is crucial becaut it allows the user to directly influence the efficiency and left the the systet the three most common ways for improving the Peltier elements efficiency in case of cooking ..

- reducing St , Optimizer heatsink and fan.
- minimise power losses isolate the cooled area ..
- optimii cop selected ..heater

Performance vs current..

Recommendation manufacture : ferrotec ,rnt ,

- power supply for controkkk .contrikk object ,element ,heat ...

_ power cool the object down 10° c was in class than six time more ,56 w vs 9 w ..

- the heatsink temperature in case 2 was 5° higher , lead to higher temperatures in thermoelectric.

- the 5 k higher heatsink temperature result in Heger dt Peltier elements..
dT= Ths- to = T am + Δ THs - to ..
* Linear vs smps tec controller , there twi ways commonly used DC cuy for driving Tex .way use linear power supply .while other ...

Controllers ,single dual channel ,from 1,2 a up to 2,× 16 A,,up to 30v
* Background information :

Thermoelectric system ..
- thermal schemay .
Design process :
Estimate heat loads.
- choosing a Peltier elements .
- choosing a tec controller .
- hear sink .
- fan
- example calculation.
- temperature sensor .
- power supply requirements.
- test step ..
- thermoelectric cooling asssmblies.

---

* Background :Thermoelectric cooling ,termi electric material , thermocouple ,thermopile,thermoelectric generator ,radiostooe thermoelectric generator ,. Effect cedar flux junction different type material heat pump solide state active pump transfer from one side device consumption .. instrument , Peltier device , solide state , thermoelectric cool thermo electric battery ....
- requirements : semi conductor because if room temperature operationej ,high conductivity to reduced electrical resistance source wast heat .thermaj conductivity . From back cooler .complex high cekk ..
- material. ..
- identificay and characteristics: I'd universal ..number of couple current rating in amps ..
- very common. Tec - 12796 square ,40 mm size and 3-4 mm high ,are found few sold to move around 60 w or generate a 60° c temperature dift ,,6 a current ,1-2 ohm magnituy ..

Content :
1.Operating principle.
2. Construction
2.1 design ,
Material ..
2.3 identificat and character .

3. Strength and weakny.
3.1 Benet .
3.2 disadvantages.
4. Perft : use .
Consumer prodt.
- industrial.
- science and imaging ..
Operating principle , Peltier cooler by Peltier effect three phenomena make up thermo electric device two ,DC electric current flow device bring other cooler attach heat sink remain at ambiant temperat cool room in soecisj application cooler cascaded toget for lower tempt but over efficiency the maximum refrigeration cycle it limited between cold ambiet hot side the temperature of the head sink .. higher temperature ..
- construction:
Design : two unique semiconductors one n -type and p- type are used because the difference electron density the P n type semiconductor pillar are place thermaj in parallel to each each other and electrically in series when joined with thermally conductive plate on each usually ceramic removing the need for separate voltage is applied semiconductor causing to Ther the cooking ability totaj units the proportion to ...remove in later ..

- materials :
Value for various materials and bismuth
- uses : power beverage ; thermoelectric cooler are used for application that reaut heat removal rangiu from millwatts to several thousand watts can made application ..
- consumer products : Peltier element are commonly used consumer product , are used in camping coolers electronic components and small instrument , extra water from the air dehumidifier ,camping ,car type electric cooler can typically reduced the by up ,29° c ,,36 ° f ambiantev..
- industrial : thermo electric cooker are used many field industrial manufacture requirement analyse face cycle industrial product are launched market ..application include Lazer equipment thermo electric air condit or cooler ,industrial electronics militaire cabinet it..

- science and imaging : Peltier elements are used used they are a common in thermal cycler used for synthesis of DNA by polymerase chains reaction pcr ,common molecult biological which requirement Rapide reaction bmixture for denaturation .primer annealing and anzymaric synthetic cycle..
- effect used started spaced to reduced temperatture difference cause direct ..
- Peltier element are akse cloud chamber to visualise uonizing radiation just passing an electric current they cool vapor below - 26 ° ..
- photon detector such CCD ,in astronomical tekescoo spectrometry or very high and digital camera often Collen Peltier reduced dark count due thermal noise ,dark occurs when a pixel register and electron cause ..thermo

cooler ..

- a typical thermoelectric system : tech controller ,Peltier heat sink ..
Thermal : of simple system object involved oarg if heat flowing from object..air ambuat air simolev..

____
* Design process :
Estimate heat load , amount of heat absorbed from object cold tem Peltier (AC[w] ..
Power dissipation , radiation ,convective ,conductive,dynamic ,[dQ/DT]
Load are summarised in the heat Qc transm..
- define temperature : usually the task cool an obji some give temperature ..
- two design parameters outline thermoelectric cooling application .
- to object temperature cold side temperature cold tempt) ° c
- this heat sink temperature ,hot side temperatture ,c = Tam + §Ths..
Difference between To and the is know dT (ΔT) delta ..
dt = Ths- To = Tamb+ Δtha - To ..

- 3 choosing a Peltier elements / Tem module ...
Peltier elements , Peltier elements efficiency b: on importance criterion is the coeft of performance cop ,when choosing a Peltier the definition is bhear absorbed at cold side by the input power Peltier ,COO = QC/Pei
- result of maximum cop is minimum Peltier input power mining totaj hear dissipation by heat sink (Ah = AC + Pek) ..
5 .heat sink ..
*
- heat rejected vs current ,
Qh/ Qmax ..
- cruct ..
- the thermal resistance is by Rth HS = ΔThs/Ah[k/w] ..
Δths = temperature difference between heat sink ambiant air temperature..
- Ah = totaj heat load (object + Peltier element loss ..
To estimate Δ the consider the maximum ambiat ..
- dependency of rejected heat on DT : ration Qh ,,and Qc ,,drvrariob increase..
- find ,,Qh/ QC at given current dtv,,close desired temperature ,ambiantb air temperature ,§th ..
Rths = ΔThs / (ratio AC) ...
- fan ..PWM control signaj input to contrik the fan speed tecbgenerator 1khz ,o 25 khz signaj from 0-100% ..
- frequency generator signal output reprense the rotation open collector output ..
- estimated heat load and define temperature . ..
We assume and object heat load AC = 10w to be college to zero degree ceksit ,To= O°™ don temperature is 25° c and hear sink temperature ts is expected at 39 ° c ..

Peltier / TEM module ..Qmax large enough to cobt need AC and yield best COO .. performance vs current ,cop ..IMAX heater pumped vs current graph the value A / Amax = 0,25 .. temperature difference St = 30k and relative current of 0,45;

_____
Heat pumped vs current ..
QC/ Amax ..
Vs I/ max ..
Calculate Qmax for Peltier elements ,Amax = AC / 0,25 = 10 w/ 0,25= 40w..
In the performance vs current graph we fund cop = 0,6 for our previously read out I/ IMAX this allow use cakxuk Oei = QC / ..
COp = 10A/0,6 = 16,7 kW..
- Peltier elements manufacture offer a wide range of elements their products line for element with Qmax of 49 wv..
Choose a Peltier element Amax = 41w, drvmax = 68 k ,,IMAX ° 5 A and v mac = 15,4 v
- the operating current voltage are calculate ..
- I = max .(I/ max) = 5 A× 9,45= 2,25A
V= Oeu / U = 16,7 a / 3,83A = 7,4# V ..

_____
Test your setup :
- thermoelt cooling assemblies :
- product : overview ,tec contrikkerv ,laser diode drives ,LTC control ,system ,software ,,
- customer .compagy :
- build solutions to fundamental challenge in developm economic master cvx

.

-; **1*.4.1.2.53..*overview : automatic ,logic system logic controller PLC information wave engineering computer ,informat system** ..

- numbering system form the basis for all computer and digital systems ..
- decimal denary counting system uses the bass of 10 numbering system where each digit in number takes on one possible value called digit from 0ti 9 ,, 213 base 19 ..but as well as having 10 digits (0 through 9 the decimal numbering system also has the operationel of additional (+) substration - , multiplication and divist ..
- in a decimal system each digit has a value ten times greater than its

previous number and this decimal numbering system uses a set of symbol together with base a,to determine the weighty of each digit within a number ...N= bi.a ..
N is real positive number .
b is the digit .
a is the base value and integer ,I can positii nehatiy or zsri ..
N= bn.q^n ..b3.a^3+b2.q^2+b1.a^q+Bo.b^2..
- decimal numbering system : in the decimal base ,10 denary numbering system ,each integer ..
- value ..N= 6163.base 10 ..
- 6000+100+60+3=6163..
(6×1000)+(1×100)+(6×10)+(3×@)=6163..
(6×10^3)+(1×10^2)+(6×10^@)+(3×10^0)=6163..
- MSD   significant LSD ,,6 MSD carriers ..
- the binary numbering system : binary system most fundamental number system in all digital and computer bass and binary number follow the same.

_____
- digital logic and computer syst use two vslue or state represey a condition logic level ,# or logic 0 and each ,0 and # is considered to sign be single digit in bass of # bi binary numbers systeb ..
Representai of binary number ..

____
MSB | binary digit | LSB .

___
2^8| 2^7| 2^6|2^5|2^4|2^3|2^2|2^1|2^0
256|128|64|. 32. |16 | 8. | 4. | 2 | @..
.___
Converting binary to decimal number ..
- decimal digits value: |256|128|64|32|16|8| 4 | 2| 1
- binary digit value : 1| o|1|1|0|0|1|0|1
.(256)+(64)+(32)+(4)+(1)=357.base 10 ..
- binary to decimal array digitsj ,101100102 base 2:
- binary to decimal summary ..
- bit is abrevy derive binary digit.
- a binary system has only two state logic 0 and logic giviy a bass of 2 .
- a decimal system uses 10 difference digits ,0 to 9 giving a bsev19; a binary number is a weight number value increase..
- binary ,octaj and hexadet : modern computing digital electronics bases are base 10 ,base 2 ,octal bass 8 ,hexadecy 16; converting between bases other decimal convert to ..

 Base binary number | base 19 | base 8
000. | O |0
001. | 1 | 1
010 | 2| 2
011 | 3 | 3

100|4| 4
101 | 5 | 5
110 | 6| 6
111| 7 |7

_____
Base 2 number | base 10 | Base number
1000| 8 | 10=1× 8 + 0× 1
1001| 9|. 11= 1×8+1×1
1010| 10| 12= 1×8+2×2
111100 | 69 |. 74= 7×8+4×1
111101|61| 75=7×8+5×1
1111101|62| 76= 7×8+6×1
1111111| 63| 77= 7×8+7×1

_____
The number ,64 in base 8 represented by 100base 8=1×
8^2+0×8^1+0×8^0= 1× 64+0+8+0×@ base ,, 1000000⁰ base 2'

...

- binary decimal ,bits ,nibles and bytes .
,common binary number lengths ..
2' s 0' common bit binary number grouo of 4 bits called ,nibble ,8 bit byte
- length | name | example
1 | bit | 0
4 | nibble | 1011
8 | byte | 10110010101 ..
- word time time processor.. architecture of processor ,16 bits ,32,64 ..
- padding leading zero ..007
- bitwise operator : number of manipuy binary value add
subtract ,value ..bitwise operator ..
- bit by bit either or two full binary number bollean logic operating on a
grouo of binary symbol electronics programming ..
- comolemey .not complement of binary value is finding exact opposite of
evry about function number and turns evry 2 into 0 evry a @ the completed
operator call not ..
- for ex to find the comolent ..of 101101010 .
Not 10111010202 decimal .182 ..
01001010 decimal ,74; not operator single binary value ..
 Or
- 0or 0= 0 ,
- 0 or 1= 1
1 or 0 = 1
1 or 1= 1
100111010 or 01000110= 1101110

- and .. conjunction..process of and ..
0and 0 = 0
0 and 1= 0
1 and 0 = 0 .
1 and 1 = 1

- for example to find the value of ,10011010and 01000110 start lining up each value

- 10011010 and 01000110 = 00000010
And like multiple multiple by zero ..
Xor =™excluy or xor regular except..

0 xor 0 = 0
0xor 1= 1
1xor 0= 1
1xir 1= 0
- notice resulting from two 1' s ,xor toget..
* Bit shifts : operator listed above handy tools manipulation a single binary value , are two component to bit shift the directly and the amount of bits to shift...left or right shift of number ..
- shifty ,10011010 to the rigth two bits ..
- rigth - shift ,2;, 1001100 decimal 154;= 001001100!..
Left shift - 110011019

_____

* The Boolean eauatt for output 4 product teen map four # correst p terh forming grouo cells ,P terms simplify result converting truth Boolean exprey,gate diagrat ...,toxic iwaste incinerate for comparay repeat ..
Introduction to knmao karniugh ..
Sop ,sum product ,,sum .POS product of sun ..information fill grid grouo ...-step to solve expression usingbk map
- selected k Mao accordiy the number of variable .
- identify minterms or max term as giving in problem ..
- for SOP put ,@ s in blocks k - Mao respective to the minbterms ,0' ..
For POS put 0' in block of k maps ,make rectangy grouo contain in power of two like ,2,4,8 cover many one group ..from made in step the product ..
K- Mao of 3 variables -
Z= sum ,A,B,C(1,3,6,7)= sum ..logic simplify

* Course ,course catalogy.
- computer science .
- computer archiy .
- foundamentsls of digital logic desiy.
- beginning design .

- logic gates truth table and logic equation .
- karnsugh mapping

...

-summing these product term we get final expression.
(QS+Q'S)
-pos form ..
2.k- map of 3 variable..
F(A,B,C)=(0,3,6,7).
-A B res
A' B'
Non sun
(A'+B')
(A+B+C)
(A'+B')(B'+C')(A+B+C)
- k - map ..
F(A,B,C,D,)

Final product ..
Gate annulemey law - a variable with o red while variable ,0 res with 2 ..
A.O= 0
A+ 1= 1..
Identity law in variable unchanged is red 0' or and with ,'2' ..
A.1= A
A+0=1.
- idempotent law variable when it is or ed or and .itself ..
A+ A = A
A.A= A ..
- complement law in this law if complents is added to a variable is multiple ..
A+A'=1
A.A'=0..
- commutative law , variable order does not matter in this law ..

A+B= B+A
A.B= B.A..
- association law the order of operations does not matter if the priort of variables are same ..

A+(B+C)=(A+B)+C
A.(B.C)=(A.B).C
- distribution law this law opening of bracket ...
- de Morgan law the operation of and or logic circuit is unchat off logic are inverted the operator is Frome and to or the output is inverted ..
- (A.B)'= A'+B'
(A+B)'= A'+B

- binary decimal
11111. Likewise. 99999
+. 1. +. 1

_____
100000. 1000000
- such long strings are quite common in the binary system . From that one that large binary number can address using two simple steps ,without exercise carry operation .in the following two numerals are being added toget : 111011111
0 base 2(958 base 10) 1010110011 base 2 (691 base 10) using the traditional carry method on the left and the long carry method on the rigth ..

Tradiinel Cary method .,vs ..long carry method

11111111) carried digit. Carry the until is
1110111110. 1110111110 CROs
+1010110011. +. 1010110011

_____
=11001110001. 11001110001

Carry 1 the 1 until is on digit past the string below ,,cross out string ..
And cross out that was added to .

- the top row show the carry bits used .instead of standard standay carry from colom to next lowest ordered ,1" with corresponding place

- addit table ..

0 1
001
1110..
-- binary additional ..
* Substration ..
0_0>0
0-1_1 Bartow
1-0-1
1-1-0

*Subtracting ,"1" digit from " 0" digits produced substrate next colom

1101110
- 10111

_____
= 1010111
Starred Colum are borrowed..
10111111
-101011
= 0110100

Substration
A-B=A+ not B + #...
- multiplicatt : binary is similar to its decimal counter ....
If the digit in B is 0 the product is also 0 ..
- if the digit in B 1 the partial product is equal to A..
-
1011..(a)
*1010(B)

_____
0000
+1011
+0000
+1011
----------__&
= 1101110

_____

1*.4.1.2.54..*Overview : mathematic
Introduction : engineering..teach mathematic didacty problem teach mean concept dichotomy role ICT information technology communication...
Logic arithmetic binary ..

2 literature review : article mathematic problem constructy agree research student error found text of theory means subject ..responsibility academics.
Based on a series concerning and teachings
Means ,compulary , tissue if reasoning means ..
Reformulation formalizary ..
- imolict model associated ..
* Problem : mean according teach tools create axion of algebry..dialect answer view language ..
- accord linguist level unity function of language ...
- in mathematics rather function ..
- teach of mathematy language study impletation..

- fundamental question ICT ..
Framework qualifications occupation
Trade council and .

- research hypothesis : research hythesis system of education importance to ...
- approach method : learn dificulte student Forman accord spatiaj formal coded manage .
- question grade 1 to twelkhigh level framework qualicafition .
2. questionnaire forb educator..
- proposal of tools for managing dichoty mean ..
,- tools presentation ..
- regime of assimilation accord Rene guitar note (X,y ,) e,e,y - X wath wath proposed .y is..
-
Curve ,,y= artg(X) appears in the regime ,a as ..
- component of surface z= art (-) surface ..
z = art(-)+(x-1) y or the surface
Z= x.y + artg(y) curve of a functy as plane section of the x ..

- calculation of assimiliay and ICT dialect ..
- tools confrontaty the contingency ..
- questionnaire objective : aim of questionnaire where wherev.. logarithmic bdescrib that,y = kx + ln ,(X) ..k EIR using two lines of equaty ,(y= -2) and ,(X= 1) and the curve plotted ,y= -2+ln (X) ..
-activity 2. ..

- calculation cluster police language policy procedure memorise lesson mathematic education group ,

- ,

..

...

1*.4.1.2.55..*Overview: engineering telecommunication and communication
Component telephone and cellphone.
-;*introduction to telephone
- principle of the telephone analogic .
- organisation constitution of commuty RTC .4

- commutator .
-Diagrams schematic pricple of network telephonic
- structure arborecent node local ,,boucle ..- structure of anneau ..
- communication between telephone and central ..
- phase of establish of communication..
-connection liason between telephone and central telephone ,,generation
- connect of telephone switch system
Combine
- ..sound ring

- display number use telephone ..
- sound activation ..
- transmission of voice
- connec .plug telephone ..batterie
- cabling .: ..
 microphone :

* Introduction :
Principle analogic : telephone use distance transmission use electricity current analogue and signaj..
-;line 2 wire for signak,
- source of energy electric , voltage DC supply Post telephone installation b..
- organes constitute:
Microphone : is converter energy ,wavevsound vibration signal creation .of membrane.
- head loadspeeker : give acoustic sound in form enegie electrical transform ..
- adaptor bimpedance combiner ..
- two diode input in disc on receptor , voltage ..
- rotation Cadle ...

_____
Radio technical :
* Pentode : amplification of power TV
Sound and basic time line..

- characteristics:
Eating
- indirect (cathode insulation wiring tube : vf = 6,3 V
Power supply in parallel : if = 1.05 A
- conditit use nominal:
- voltage anode   : Va = 170 ,, 250v
- voltage of plaque gille 2:= VG = 170..250 v..
- voltage plaque 3:   vg = 0...0 v
- tension de la grille 2 ..vg# = 22- 38,5:v
- current anodic : Is = 45 ..,32 mA

- current of grill , if 2 = 3   2,4 mAc
- coefficient d ' amplifu : k = 62 ,69
- resistant internet   P= 10 ,, 15 Kohn ..
- sloop=   s = 6,2   ,, 4,5 mA ..

Capacitor :
- capacity of grill , CG = 14,7 uf ..
- capacity of anode.   =6,4 pf
-cPacite anode grille ,. CAG <0,8 of
* Measure blin ..
- value limited

Voltage anode peek ,vap ,,max = +7 kV
Voltage of anode ,Va = max = 300v
Voltage of plaque grikk 2:VG ..max = 300v
- power transmi on anode Pa max = 8 w.
- power transmit and PG 2 .max = 4,5 w
- power total transmit anode plaque ..
Pa+Og2 max = 10 w..
-resistancd du circuit line ..max = 180 mA.
- resistance of circuit .RG .max = 0,5 mohm ..
- voltage wiring .vkf ..
Flip flop videu isolate 16 metal package DC - DC converter side ,4:# input voltage range..DC - DC converted to 86 % efficiency operati temperature of uob,80°✓full load and comply with En
- equipped we industry standard safety feature overload short circuit protection

 class a conducted emission
-build in En 55022 class filter
- specification :
- attribute : value
- output voltage : 24 V DC ..
Input voltage -- 9 --- 18 v DC ..
- input voltage
Nominal : 12vdc ..
- isolation voltai : 1,5 kV DC
- power rating 8 w ..
- output current : 335 mA..
-mounting of output ...
- number of output 1
- efficient. 85%
- package : DIP. 16
Minimum ..
Temperay - 40° C ..
- lead regulation 1%

- standard ,ANSU / UK ,class,EN 55022 , ,IEC : 60950..
- depth : 8mm
- series : tel 8..
- maximi ..
- temperature 80° c
,- length : 23,8 mm
- width : 13,7 mm..

-;reconfiguration sofwar radio dynamic spectrum ,, radar add passive radar safe operatv..
Software defined radiod ,, usro , MHz. Universal software radio pheriphery , generate ..
-schemaric synoptic of vg 5000
Research cycle instruction
- clock watch
- air conditioning computer .
--initialisation .
- programme memories .
Programm life memories..
- background of pseudo static memories
-decider address input output ..
- button keyboard..
,- interface sound ,input output ..communication procrdgr
Spectrum occupancy measure an autocorrelation base dbscanning technical ...Dakota. Frequency ..
- detection sensing

- installation system home house bulb fluorescence ,tube , oenthod radio technic
House installation ,property .instalatir ..controller organisation house home.
Inspector .. emissions..
Db box out let bulb ..

-;

...

* Overview: resources multimedia : Les processor of signal numeric

materials logiciek cisco ..
- support fax and modem : trafft fax and modem charge up ACU catalyst port ..
- platform | function | logiciek version ..
Call manager | PBX Io | 3.0(10)
- catalyst 3500xl| commuter of distribuy | 12.0(5.1)xP..
- catalyst |pricips commutation | 5.5 (5)
- catalysr | commutator local |
- processor cisco | 12.2(4)
- routor cisco 3640 • passerell h.323 | 12.

_____
Information conexes : ...
Controller

Number. | Cellphone | list router | AARnet
0,0[2-4]xxx
0,0[7-8]xxx|cellpno | list router | AArnet
0,0[8-9] call 1800 | local passawre | nothi
0,1144x | urgent | passerell local
0,119[time | passerell |
0,13[4-6]
[0,130[] list
5xxx[]
- controllt access international AArnet deployment passerej USA ..

-8warn system
-
- traffic control correctment classification effective ..
- traffic class ..
- voice source ..

Access list 20 permit ..
IP priority ionuse for dinguish traffic vocal of traffic ..
- class Mao match all voice ..
Combine ..
- class mO match all voice gateway.
- match class Mao voice .
- match access griuo 28;.
* Use principle paauet source ..
- class Mao match all voice not gateway .
- match class Mao voice .
- match not access griuo ..
* Control: traffic vocal source not disability class .. traffic ...Io of 0
- policy - Mao input - voice .
- class voice not gateway.

- set up precedence 0 .
- interface fast ethernet 2/0/0
- description downstream voice gateways.
- service policy input - voice ..
Research router pack voice IP of N exist acun source Connie ..
- policy Mao input - data .
- class voice serv
- set up precedence policy
-* stand by voice ..voio condition terminal conctb..weight random early detection ..
- policy Mapnoutput data ,ATM
-class class default .
- fair aueee.
- policy Mao output data VIP - ATM
Class class default.
- random detect ..
- policy Mao output data data ethernet .
- class class default fair aueee
- random detect .
- policy Mao output voice - ethernet 30 .
- class voice .
- priority 913
- class class default.
Fair aueee.
* Policy Mao output voice ,vio ethernet 39
-class voice .
- class class default
Randit detect .
- policy Mao output voice hdkc 39
- class voice
- priority 768
- class's class default.
- fair quee ..
* Card strategies specific d interface actually b..
- interface ATM /0
Device policy output output voice ATM -39
-interface ATM 2/0/0
-interfay ethernet 2/0
- interface ethernet 3)0/9
Interface seriaj 4:/0
Interface seriaj 5/0/
* Evolution v: mechanism voio .list IP Voix ..
Proxy H323 ,control input

...

Curriculum section 2

2.1

2.1 Thesis. Degree honor, council quality rules low become justice development court and labour relations conciliation mediation, Engineering electrical trade research policy skill ,safety security order develop ,defense order

2.1.1.Overview: method research assement: caps ncv trade ucpd seta sasseta

2.1.1. Overview: method research assement: caps ncv trade ucpd seta sasseta
Introduction
Context of the school
- research participate.
The response from teacher and hod ..
Presentat of reseat findings ..
- from challenge face by teacher in implentation :
- summary of empirical findings
- wath are barriers to implementating od system
- how user .
- friendly teacher found .
- his do teacher respond to change .
- final research ..
* Recommandatiin f the study ..
Recommendation to the department education DBE dhet ...

_____

2.1.1.1. An overview of the study : .

- introduction and context of study ..
- signifiy of study.
- statement of the problem.
- aim and objective study .
- research questions.
- hypothest
- litterature review .

Research methodology .
- research design .
- participants sample :
- data collection :
- litterature study :
- questionnt:
- interview .
- data an analysis .
- limitation of study ..
* Definition : ethical ..
- introduction .
- definition of term .
Definition terms .
- defining integration circulum
-* technical education subject .
Bricklaying and plastering .
- technology ducatiin subject ;
Subject civil technologies.
- international perspective brsa .
- RSA civil technology .
- implementating of civlt technology circulum b.
- teacher role and attitude :
2.1.1.2 Content knowled ..
Transferr knowledge using different ..
- infrastructure and resources .
- time allocation in civil technology ..electrical technologie ,mechanical
- * research design and methodology:
-introduction .
- research design .
- population and sampling.
- data collection and instrumentat .
- interviews
2.1.1.3 Data analysis
- interview
- questionnaire.
- data presentation and interpretation .
- presentation data ..
- presentation of data from interview .
- discussion of find ...teach ..
Purpose of integrating technical subject in civil ..
- role of teachers in integrated civil technologie curriculum ..
- teacher attitude toward ..
* The interrelation between mathemt science ..
* Relationship ..
- woodworkshop floor wood working ..
* Relay main topics .

* Strength of quality research ..weaknt qualitative ..
- data analyse ..
- validity and reliabiy of researche instrument ..
- ethical consideration .
- summary :
- finding analyse and interpretation of data .

..

-**2.1.1.3** project :
- referral number , application labour court CCM council bargaining Jr 2461/15 ,JA 37 / 19
- Portofilio evidence of low outcome appeal labour court Ccma and labour and Ccma notice motion .
- Ccma ruling outcome award requested arbitral security low labour ,lra gn enforcement .
- Portofilio : humain rigth complain rigth to appeal offended constitut low probono LRA gn rigth ..
- portofy Sherriff Ccma notice of motion Ccma labour affidavit enforcement low labour ..
-- Portofilio : national council bargaining private security ligation complain basic salary coberay statement Ccma labour levy salary .
- provide fund private security sector levy complain .
- perusal union police bargaining ..
- national police bargaining .
- national fund security fund sector fund coverage .
- Portofilio : sars filling tax return Cass Deb collected order court revenue tax Cass rescission ruling tax ..
- sarb .bank note order process invoice industrial research .
- cipic : deregistered compagt proyedty empowy trade industries compagy order commission economic empowered intellect director order court .

- labour department uif coid dok order court filing Cass inspection order court compensation body frame sets sasseta skill development .
- dhet merseta fund court order award ruling transcript certificate research los security granted review arbitrat research educaty department ruling course analyse submission research survey .
-- diplomat certificate award biding variation ruling award ,variation ruling diplomat assessment skill development diplomat variation ruling illegal bogus Ccma variation award ruling license diploma license job .still security officer grade a,b,c,d,e,f skill development agreement minimum maintenance job NQF level ,1,2,3,4,5,7,8 award degree diploma meet requirements assessment b. ,N1,n2,n3,n4,N5,n6, graduat doctoral degree master irregt job auditing final diploma buchellor assessment agreement research graduate to research job skill a,b,c,d report transcript certificate diploma license cpd variation bidding experimental counciy bargaining low restraint settlement agret minimum ..
- index of pleading order court :
N / descript page ..
- court appeal ,4 copy / leave appeal no order to cost 2019 .
- quotation//1 copy / transcribe bid close supplied company business .
-pleading index file record , 1 copy
- notice motion referral title / 12 / 2021-07
- referral appeal appeal //2 copy | 12 copy / 2021 - 07
- ref appeal // 2 copy / justice government.
- master court documents request file retrieved form files retrieved form record
- notice of motion ,petit for leave to appeal founding affiday ,25 copy .
- judgement leave to appeal ,3 copy no order to cost dismiy 2019 .
- rescission ruling //3 copy
- reason / 3 / copy
- judgement leave to appeal / 3// copy decide chamber application review no order to cost .
- notice of motion // 5 copy //.

- submisst analyse ruling .
- bid argument leave to appeal order arch file retrieved skill development /200 copy // sets sasseta psira levy
- suggestion complain statement of case request taxation deep gov 5 copy ,24 copy ,82 copy skill national private sector car guard customer trolley assistance nogada sa applicant traffic low saps traffic .
- development sector bargains council Ccma labour skill legislation proceedings /200 copy // CA enforcy low visual basic
- directive order court portion training pratice Manuel labour Ccma ruling ,25 guide as low hr fractions register spire sasseta .

- affidavit in support service ; affidavit in support service register spire by register mail process 27 of empolt appeal job possr .

- complain in term of affidavit Sherriff council finalize matter Sherif .
- Ccma requested arbiter maintence skill devy saqa low .
- referaj St peace college saqa dhet topic argument referral n diploma buchellor application master diploma skill development justice research policy ruling .
- dhet ruling instruction saqa transcript dhet time table instruction guide orientation .
- Manuel pratice labour gn lra Ccma rule Manuel
- referral closed matter bid close CCM trial .
- CCM certificate outcom dispute granted ,jr 2461/15 granted unfair dismiy concern related to if disruption unresolved Ccma ruling 2016 review no granted no granted enforcement .
- PG / description //
- suggestions and complaint form / 2 PG /
- before the honorable justice , certificate ,reason for report transcribed interrupter incorrect grammar micro .
- index of notice ,1 page
- index of notice
- in the labour court deputy 30pg
- judgy leave to , order application pratical
- reviewed application .
- season record rescission ruling referral ,5 page page / dismissal delivery .
- notice of set down order .
- judge direction in term of pleadiy , director application unoppot notice .
- notice of in term of rules notice granted reviews satisfaction prospect success execution referral rescission closed bidden proof , # PG no granted application
- application for leave to appeal award ruling direct low conciliaty letter requesting affidavit contract ,
- agent grammar pratical mantel labour conduct spire car guards casebook invoice reliant
- sasseta learner text book assessment ref web

- filling judgement appeal / reason labour
- record transcription certificate report maxi business
- Ccma labour notice motion ref ..
- nogada as ruling career meeting contract employement
- mandatt legislatt framework regulatory order security officer and police army figth portofot order low court no cost litigat commission no cost .deputy honorable member eligibility research low management system infot docket book admnister case low investigation analyse submisst low legislator survey ruling low commissioner low security commissioner security judgement guard court research car guard award ruling rescission ruling investigate sherrif bargaining find close file rescission ruling low security low open transcript certificate report coid copy low motion no cost

made was strike resissiin low I'm
...

Referral : letter notice goverment
- legislation skill development rigth LRA reason was LRA gn award ruling appear petition low affidavit found and registrar afft notice motion land development skill low unlow reason refused review application no prospects successful low labour submission ruling sherrif and council bargay low trade .
+ Private security sector licdnsuy agreement licensd security agreement for security license security psira grade a,b,c,d,e sasseta accredt seta skill development certificate office type patrol office reaction supervisor management office private career administration graduate agreet level 1,2,3,4,5,6,7,8. Duty senior operay special duty function licensd term issue duty officer labour justice security policing solitaiy low agreement diploma to license compententency was license business revenue license use sector private Nd transport driver code regulation traffic security private use sector and licensed transport driver code regulation traffic registration security private car guard unlow sector unlicensed type vehicle code security access road parking policing conduct
-invetigation framework regularities vehicle in relation circuit crime methode research incidence government mandatt police career job trafficking control and police firework order to arrested search car license form government sector car guard officer power licensing car petition refused minimum maintenance was not prospect grantees sector private term guaranteed Patrik record award rescission empower low security private sector saps to agree officer to keep with competency fire arm police for private sector petition dismissed or miscellaneous guard council bargay wage minimum allowance coverage basic salary certificate no license unlicensed sector private businesses ownership business sars relieve officer and change posted parking car .
- saps license fire arm appeal used framework regulator .
- license traffic registration car driver safety station car guard agreement to private security regulatory ..
- trade test agreemt review dtic industrial car guard private security industry industrial city infrasture development license agreement sector manufacture car monitoring to safety guard agreement rescission ruling balance onus steel worker construction low become rescission ruling survey LRA nova electro compt term frequency radio elibility station radio regulation interclass rescission ruling private sector radio transmission security authority agreement rescission ruling nova agreemt Stell industrial bargaining low agreement minimum council bargaining private

security survey can agreemen license certificate radio bravo delta encode decode seta sasseta community skill saps frequency license agreement digital audio transcription labour court proceedings report code transcry and notice true office dismissal code verbatim clercj record copy minute counciliation private sector certificate grade agreement radio speaker process decode agreemt report to low sasseta grade agreement radio speaker process decode agreements report go low management electronic ,X metallic detector certificate workstation computer alarm record low..
- agreement cash transit flow agreement agreement to facilitator and assessment low was poor conditt rescission refused petition sherrif enforcement low licensi metak detector license alarm electronic refused petition Sherriff enforcement low licensing metal detector psira license alarm electronics management cable dismissal by nova low concilliation was not granted by bargaining private reason no license permitted basic Ba salary audio close supplies saps sabs license refused rigth appeal nova low security to operate code security private national trade national framework saqa council trade no license theory licensd pratice electrical council psira test criteria license term wiring compliance coc conformance no theory explanation rescission ruling facility moderator assessment low in order management system Mandai public system manai information order to recruitment information security theory operationel profile file Archduke reviews retrieved by sherrif tax order theory exam crissiny skill administration humain no mandatory framework legal radio licensing protection legal digital audio certificate court day private compagny intellectual property and tax revenue was deregister for media copyright no granted theory licensd biding diplomat Engineering in court referral topic .
- license product exclusively company disciplinary used abusive national trade diploma award cery national trade award diploma no license l trade sabs license award is order cost judge made money council bRgaini made order granted cost award is judgement order monetarism .
- award is no licensed work is price nobek brevet license is summarised evaluation ,award debtor ,uif coid ruling labour ,
_____&
- national bargaining council for private security sector
- complain form :
Ref : party employement
Name surname :
I'd passport
Employment number
- job description
- date employed
-:address complat
- email address
- cell number
- alternative cell number

* Details
- detail of employer .
- name of employer :
Details of employer .
- name of employer
- name of supervisor .
- address of employer :
- registered in terms of section 29 (15)(a) of the labour relation act 1995 reference LR 2/6/6/164
* Nature of complaint statutory violation main collective agreements clause ,LTA 7.13 ..explanation : arbitration requested the certificate of no resoly been issue on dispute summary award ruling review labour court record transcry nogada labour appeak court judgement notice petition granted amount financial award certificate security service no payment settlement of partie emplomet outcome requirements .
- ruling order agreement transcription record report of jurisdiction award the system indicate matter jurisdiction skill development legislation review matter to be refered for adjucate by court case with draw outcome jurisdiction determination rendered conciu extensiy tenure security development the biding certificate ..
- union memberst yes ..
- nNe of union
- union represet involved
* sector umhlaba risk solution ..
- over the past month appointment provided to oversee and manage relating collection and administration of levies , LV 5090 ,
- dear value employer tshingombe CCMA labour .
- kindly be reminded that you have not met you statuty obligay to remit all levy contribution inclusive your portion and that the employee in your employ to the council's register bank account registered bank account the said payment were due on the 10 the day of the month in term of clause 6.2 of the levies collective agreements gazette no 42975 of 29 January 2009 -to avoid futhure accumut of interest calculation in terms Claus's 7(7.1)(ii) of levies collective agreements and the prescribed rate of interest act 55 of 1975 please transmit your levies urgently .

- futhermore kindly that the council will not issue a letter of good standing to any employer who has filled to fulfill this obligation and has outstanding levy payments due let me know kind regards compliance department .. Compliance department NCC intercomplian s 2 nbcpss .org.za

_____
- *compliance order :
- compagny name : tshingombe Ccma labour
- trading name : tshingombe labour Ccma
- cipic reg :
- physical address

- email address :
- contact ;
- contact :
- levy number : LV5090
- nbcpss
-cass number : levo case s/ 00168Gp

_____
- you are hereby order to comply with bellow provision of the levies collective agreements .no 42975 goverment gazett 29 January 2029
- contravention from the levies collective agreements
-clauss 5.1 and 5.2 levies contributions | period of contravention form 01 March to 2024 R 7420099
- clause levies scheduled : 01 March 200
- clause 7.1 interest
- total money due to the council : R87163,7#
- fine 0@ March July R20.000.0/
Total amount payable in lisin of fine faillure to Comply with section ,33A, (13)(

- should you comply as indicated with the above mentioned contravention with 14 day period the matter will be regarded as finalised should you however fail to comply the matter will be referred for arbitration and you may be held liable for future arbitration .
- fines : if you fail to comply the secretary of the council may recommend to an arbitrator that a fine reflected in paragraph table be imposed in accordance with provide for in section 33A(13)(a) of the labour relations act 66 of 1995 a service
+ Objection : you may object this compliance order by making a representation to general security general cei the council with 14 days of the receipt the compliance order faillure to do so will lead to the invocation dispute resolution procedures as contained in the labour relations act 66 of @995 other legal resources
- fine in term of the section 33A(13)(a) of the labour act 66 of 1995 ...faillure to comply in respect of same provision years
- assessment breakdown calculation as calculate marked sheet

-Month outstanding |
total month outstanding|
- total ee
- R value pm out and
- interest period pub public date .
-total bcea .
- r value pm outstanding bce
- interest calculation .
- gross due
March 20 to Jul 24 ,, total

...

-:Pension found adjucator :
- enquiries : mphele
Email
- date :
Please quotate our reference : GP\ 00096285\2023
T.tsingombe
- complaint in term of section 30 A of the pension funds act 24 of 1956 , the act . tshingombe ," complainant v private security sector provident found ,fund salt employee benefits (Pty) Ltd ,(fund administrator and nogada security .
- we wrote to you on 22 March 2023 requesting they youth furnii us with following information to enable us to investigate your complain futhure

- that re complete our complain form as we cannot investigate labour matter filling out all the required section section and indicating wath assistance you need from our office related to provident fund issue under the backgy section please indicate your previous employment history as security officer where you have worked nogada security and when dates office where worked before nogada security and when ,date
C
- proof of fund membership in the form of a payslip showing provident fund deductions made by the employer and copy of any fund benefit statement .
- you we request to respond to this office no later than 23 April 2023 however you neglected to do sa follow up attempts for outstanding information were also unsuccessful with the futhure particulars to establish your standing as a complain in term s of the act ,this office has no option but to close your file as it impossy to investigate any further .
- tracking your complaint online the status of this complaint can be tracked online by going to PFA click on check status on the home page and search using the Cass reference number given this letter your I'd or passor number your ..w Groenewald ncu assistant adjudicati
...

- member :
South Africa union police sapu
- I'd number 072529
- birth date ,month October ,initial : tsh ,,fist name : tshingombe , surname : tshitadi ,,title .r

- personal contact details :
- phone number : post nom address :
Employees address :   ...email ....
- rank held Mrs   station :   office number ...
- region : Witbank. : province. : Mpumalanga ..
- stop order :
- employee number : .... surname initial. Tshingomb. ..
- cancellation of the other union ...
Acceptat : I the undersigned hereby apply for membership of South African policing union and undertake to uphold provisithe constitution
- I request and authorise the employer's account officer to deduct R 100.,00 month fee from mu salary as from date the monthy deduction must continue until such wring smsoutg African policing union ,sPu providing the with copy of my cancellation
- income continuatt benefit six
Income continuation after death of principle member for R10,99 per month for evry R1,099
- benefit per month | premium | select | benefit per month | premium | select

- optional benefit | cover | premium | select
- air time | R250 | R.69
Car hire | R 7.500| R 34.19

_____
Total premium calculation
- total immediate family funert premiy ..
- wider children premium
- extede family premium
- income continy premium
- air time premium
- car hire premium
* Premium payment :
- persak deduction authorisation
- name :
- rank .
- I'd number
Amount :
Policy prayer ..
When selecty payment via perusal please also completed the debit order

section to be used only in case of limit exceed .
-acciunt holder name :
- bank name :
- account number :
- amount .
- account type : cheque ,savings |
_____&
Dibananj. ...
New application : ammendement | transfer
- scheme option | A R8000| B : R 1300 | C : R 1700 € D : R19000 | S: R 19099 € E : R 30000| F: R 5000|G 75000
- rwpresentatt :
Cell phone province ..
- application for voluntery funeral assurance with extended family benefit

- personal detail of policy holder .
- region : | station | department |
- surname : first names :
- I'd number
- cell number
- email address
-postak address
- resident address
- country of birth
- nationality
- source of funds ,salary ,pension grant € allowai | social grant | maintenat inheritance | retirement fund process gift donation ..
- method of spouse
Details of policyholders children ...

_____
Personal detail : fist name ,surname ,initials,marital stui,
- dependants details : spouse name ,I'd initial title ,gender ,tsl number

_____
- saps : 432
South African police service ..
- cancellaty form for deduction on salary to completed by employee
- Serie number .
- I'd number :
- perusal number :
- initial surname printed
- name of unit
- contact detail :

--- details of cancellation:

- name of deduction : Levi's contribution € referet : clause 5.10.52 | amount

R 107.163.71
- name of deduction : leave contribution| ref | jr 2461/15 amount : R 20000
- name of position query ,ref | gabj 6860/15 | amount ,R: 200000
- name of deductt : leave agreement ,ref : JA 37/19 ,,amount : R 20000 ,
- name of deducy : training agreement JA 37/18 : 2099 .

- name posting accomodatiy ref : 2000..

Certificate of employee :
I certify that I'm cancelling the a I've mentioned deduction out of my own free will that did inform the institution that were deducting this on my salary about application to cancel said deductions ...
- signature of employee | rank officer
- intiak printed .....
- date stamp : received at head officer .
- completing the form :
This form can be typed or hand written but must be signed by employee who wishes to cancel said deductions and date must be indicated ..
- employee will give the employer three months wiritten notice to cancell membership .
- financial insty must also be informed about cancellay or deduction can be reinstated by financial insty : the employer will cancel the union deduction after periods three month has expired on receiving the notice ,agreemt 01/2015 , 5,4 date 2015 /05/19 - other non statutory deduction policies Messe etc will be cancelled with immedy effect ,salary closing date should be take into consit .
- understand that excess money deducted from salary must be claim from the instiy and not from the employer..
- particulars of employee :
- the employee must complete his per persal or idsntificatioy number is ,
-;the employee must comply his personal particulars request name of city toer stafuon Norman work employee..
* Certificate of commander ,: the commander must have knowledge of the application for cancellations of employee ..
- for head office
Capturing : tank initial surname ..
- approval : rank ,initial and surname .

- authorisatiy : rank ,initials and surname

* Membership applicatt form : hope you will find order as requested fikk send it back to me please cKk when you need us to explain how dibNanj work you have workslifs porch please below silanabk death claim benefit that you have access as sapu as welllegN benefit that you have access to which are both inuded in your membery contribui fee R 100,99 futhure

funeral at additiy feedicuments month fee ..
- sikanabk death claim ,in case death the main member or spouse or executor of deceased complete the silanabk provincial office or from sapu
- we trying to cajj you as we have seen that you're are not RSA citizsv we only cover for RSA ,hope you will find this in order ....

_____
Certificate of outcome of dispute referral to concilly: Ccma Cass number : GAJB 6808-15 I certify that the dispute between : tshingombe fiston an nogada sa ,Ccma ,labour partie condonation granted on 30/04 20215 .. concerning : unfair dismt , ,,mutual interest ,organisational rigth ,unfair discrimt , severance pay , unfair Dismissal yes ,mutual interest no ,organisational rigth no, unfair discrimination not ,severance pay not ,unfair labour practice not ..
-;and relate to misconduct not ,reason unknown not ,incapacity health not , interpretaty and application not ,operational not reqyiremt not ,incapacity poor work performat not ,,enrolment not ..
- condonaty yes granted ,,not applicable ..
- was resolved on the at 29/03/2015 to 2025 ,, if this dispute remain unresolved it can be reffered to ,
- Ccma arbitrat ,labour ,none. Strike locket..

_____
-* rescission ruling : award
Case number : GAjb6808-15 ,commisinef Elizabeth lerumi ..date award ,20 August 2014 in the Mather tshingombe fiston tshingombe union applicant and nogada security Ccma ,labour responder ,sapu ncbpps judiciary Union / applicants representat : on papoers address :

- responder representart : responder address , .telephone
1.Background and issue for decissy :
1
The applicant in this matter applied for rescissiy 10 June 2015 of the dismissal ruling issued on 29 may ,2015 the applicant become aware of the award on 02 July 2013 the reffed dispute concerns an alleged unfair dismissal the Ccma is requested to rescind the ruling because the applicant submit there Re sufficient reason ..
-2 survey of submisst ,case of the applicant :
2. The applicant stated that he was not in wilful default of the Ccma he submitted that his address and cellphone number changed he submitted that he has prospects of success and but it is not sufficient to just say because he was unfair dismt..the responded didn't not opposethd application for rescission .
- Analysis of submissions ..
4 section 144 of the labour relations act allows for the rescisst of any award issued if ..
a) it is erroneously made in the absce of any party affected by that award .

-:there is ambiguity or obvioy error or omission but only to extent of that ambigi error omission .
- it is granted as mistake common to parties the proceedings .
- in considering the application for rescission I m bound by section 144 the common low test rescisst has continue to be used in conjut with statury ground in determining rescisst applications this common law position has been set out in mmsteel construction ccvs steel engineering and allies workers Union of sa other (1995)15ILJ 1319 lac Nugent concluded that and applicant must tender an acceptat explanation for his her default and must further demonstrate he has a defence that is.bona fiede and has a reasonable prospect of succeeding Nugent concluded that if a rescisst application not meet that test ,rescisst would generally fail ..
6. The onus rest on the applicant to prove on the balance of probabilities that default award was erroneously made the application must be shown the bona fide and defauy must not be wilful or due to the gross negligence of the applicant part (see electrocompt (ptg) Ltd v Nov (2001) 10 bllr 118 (LC (..
- the applicant stated his address and cellphone changed when persing the file and the applicant application for rescission his address has not changed his adt is the same the one he provided in the lta ,7.11 form futhute the notice set down was sent the applicant written there is not document or note suggesting that the applicant changed his address .
- under the circumstances the abscencd of the applicF is considsy unreasonable the applicant stated that he does have prospect success the applicant does not disclose why he does prospects of success .
- taking the above in to account ,I submit that the applicant has not made case for rescission to be granted ..
- the application for rescission is not granted , date at benonie ,29..
signature commissioner Elizabeth sector security
- _____
Ccma : in the commissioner for counciliation mediatt Nd arbitration :
- Cass no : GAJB : 6808-15 date ,@9 July 2019 ,commissioner : Elizabeth lerumi ..
Applicant / union : tshingombe fiston tshitadi
- respondent : nogada security service

Award / ruling / Order / directive
The applicant applied 04 the Ccma does made jurisdiction Cass the said ruling review was review the review was dismissed the Ccma must close the Abid the application not happy outcome the judge outcome dispute the labour appeal court ..

Request for arbital..detail of party requested arbitral ,
- dispute detail
Dispute summary :
- detail of the other party , you are ..

- 4 outcome required : resulted requirement granted review
- outcome required :
- confirmat of above details : submitted name ,position application ..
- partir refer acknologg

-Transcriber certificate :
This is to certify that insofar as it is audible the aforegoing is true and correct transcript of the proceedit record by means of a mechanic ordern
The matter of
- tshitadi fiston tshingombe v nogada security .
- case number : jr 2461/15
- records at : labour court
- date held : 2017-01-18 ,, order to transcriber : ms brigth
- date completed : 2917 - 04-11 .
- number of CD / audio files : 1
- number of pages : 8

- report on recording : indistinct word and parties not position close to microphone partie intervening each other ..
- court stenographers annotations incomply ..
- where not clear annotation are furnished nme are transcriber phonetici..

Digital audio recording transcrii ..
...

- notice to appeal outcome of a disciplinary hearing security guard procedure court house room incidence file refund lost case ..
- note this only applies to level ,@ and level 2 internal hearings level 3 hearings appeal must be lodged with the Ccma labour court record transcription ..
- staff member detail :
- surname : tshingombe | first name :
- preferred name : tshingt employee
The chairperson will need to write up the appeal hearing record contain the followings
Chairperson name ,job title : departmt internal
- job title : security | departmtv
- grade : post level : grade a,BC, s
- your representative in the disciplinary process :
- data received notification of the outcome of the hearing
- reason for appeal case occured :
- substantive fairness

Penality was not approot to charge charge .
- the penalty was not consistent relative to other similar Cass of discipkit in your work area .
- mitigating circumstances were not considert .
- procedure fair ess , hrv
Reason substantive fairness | procedural fairness .
Please provide evidence of your claim :
.signature employee
- signature employee
- to sent the hr generalist for our work area ..name hr
1 .was the penalty appropriate to the offence this regard discipline of staff disciplinary procedure used please note that this is only ..
- was this first second or offence of this nature .
- what was the current disciplinary record to staff member this refer to all disciplinary warning that are still valid
- appeal procedure university : when appeal may be convened ..if the employee claim that one or hapoeni ..
- the incapacity procedure was not properly followed .new evidence was not submitted about performance or condition
- employee feels evidence show was biased ,she must fill review application form and give reason for an appeal ,incapact due to poor work performance

- date and time of appeal .
- all documt consider
- process follow .
- descissiot taken by chair reason for this citing evidence used to support decissy ..
- communication employee :
University disciplinary low and labour relation university disciplinary..
_____

- labour guide :
- tshingombe security Ccma labour :
Vat register
Invoice no SEM / 26#7/10CDH
Ref NR : SEM / 2627/03/10cdh.tax invoice
- description | number of delegate | price per delegate ||| nett
- seminar : chairing discipline hearing on 27 at ,conventt centre jhb Tim ..
R= 5079-13 || R 20316-52
- vat 15% R 3047-48..cancellation seminaries confirmation letter ,labour training management
- chairing disciplinary heart
- module : electing a chairperson .
- module specific type of misconduct:
- 1. Introduction

-1.2 derivative misconduct
- misconduct outside the workplace
- abscencd without leave or permiisst
- absenteeism
- abscond men
- desertion
- imprisoned employees
- faillure to inform the employer of the reason for absence .
- abusive langut and racist remarks .
- abuse of sick leave .
- assault .
- commenting with the employer conflict of interest .
- damage to property .
- neglii .
- disclosing confidential information .
- dishonesty .
- alcohol and drugs
- falsificatt
- fraud .
- bringiy the employer name into disrepute
- insolence ,insubort.
+ Refusal to work overtime .
- refusal to work overt .
- sexual harassment .
- sleeping on duty
- theft / unauthorised possession .
* Leading and testing evidence and version
- the opening statei.
- evidence in chief
- cross examination
- written start
* Evaluation evidence :
- evaluating evidence and making a finding ..
- evidentiary burden .
- evidence source types and admissibility .
- site inspection or inspection
- written statement and affidavits .
- probative material .
- oral evidey
* Real evidence photograph electronic evidence and video
- admissibility and weigth evidence
- relevance of evidence .
- character evidence
- similar fact evidence
- opinii evidence .
- expert evidence .

- expert evidence
- previoui consistent statement .
- hearsay evidence .
- priviley evidence .
- ilegali obtained evidence
- direct and circumstantt evidence .
- entrapment .
- entrapment .
- the cautionary rule
- admnissiot ,confesst ,pplygray ..
* Step by step checklist for disciplinary heart chairperson .
- disciplinary code .
- practical exercise .
- the discipline process ..

Hr manat lines manager discipline union representative .
- course outcome : after completion of the workshop participants will have a clear underst on how to chair and manager a disciplinary heart and should able to reach a decision by taking all the circumstances into considert

- chairing disciplinary heart :
Electing
...

-2.1.1.4.project .
Application for exemption terms of section 23(6) ..
- import note ,in terms of section 23(6) of the private security industry regulation act 56,of 2001 despite the provisions of section 23 (1) and (2) the authority may on good cause shown and on ground which are not in conflict with the purpose of this act and the objects of the authority register any applicant as a security service provider ..
- full name surname application ..
- applicant contact address including .
1.23 Geen perments I'd ,applicant must older ,training ,guilty a schedule criminal offence whiting the last ten years .
- guilty of improot conduct in terms of the act within the last five years ..
- clearence security it former current member of any official militait security police or intelligence force or service in South Africa elset ..

- mentally sounf ..
- employee in the public service in circumstt where such tegistraty may conflic with legislative provision applicable to the applicanttell us happend if was theft I stolent ..type of offence ,date committe conviction

- ref number :
1. Particulars of appellant :
1.1 full name and of nature person acting on behalf of a security business .appeal
- contact Dress for correspondence on the appeal :
- contact telephone fax number other electronic .
- registration
- name capacity and contact particulars of person submitting an appeal on behalf of the appellt :

- refusal to grant applicat for registration yes ..
- refusal to grant application for renewal of registration yes
- cancellation of registration .
- suspension of registration yes ..
- withdraw of registraion ..
- conviction of improper conduct yes .
- penality imposed in consequences of finding of improper
.3. Summary of particulars of decission appealed against : provide a brief description of the decission appealed against mentioning the person taking the decission and the date of the decissy if this appellant :
- labour judgey wage

4. Summary of grounds of Pleak (why do you believe that you should be register a security service provider : refusal to grant application for registration notice motion refusal grant applicay imposed in consequences of cindit registrar..

_____
* Complaints management process :
2.1.1.6. Introduction :
1.1 statutory mandate : psira statutory mandate is derived from the private security regulation act 56 of 2001 the primary objective of the authority is to regulate the private security industry and exercise effective control over the lraticf of the occupaty of security public and national interest itself of function of the authority as prescribed in section 4 (r) the psira receive process refer or deal with complat regarding the qualicafition of service rendered by security service ,in order to fulfil its mandate the authority applied private code ..
-1 complain : any dissatisfaction matter reported to psia ,a complaint relating to the quality of service rendered by a private security service provider ,code of conduct related matter reported to or reffered to the

authority .
Complain , person who lodge authority a person affected any act omission of private security service under investtv,,
- security equipment : an alarm system , a safe valr or security container..
- a satellite tracking device closed circuit television or other monitory device or surveit equipment.
- a device used for intrusion detection access control ,bomb detection fire detection metak detection X ray or security telephone communication ,specialised device used open close or engage locking mechanism or a specialised device used to reproduce or duplicate keys other objects which are used to unlock ,close or engage locking mechanism .
- security service : means one or more of the following service or activities ..
- protecting or safeguarding a person or propet in any manner .

- provided service aimed order and safety on the premise used for sporting recreational entertainment or similar purpose ..
- manufacturing importing distributing or advertising of monitoring devices ..
- performing the functions private investigator .
- providing security training or instruction to a security service provider or prospective security service ..
- installing service or repairing security equipment .
- monitoring signals or transmission from electronics security ..
- performing the function of locksmith.
- making a person or the service of person available where directly rendering of any service referred to in Parag to another person ,creating the impression in any manner that one more the service
__ '
___
-* improper conduct | psira | criminal case with saps € department labour | public protector consumer Psspf ..
Reg: business not reg rendered security whilst security is suspended director ,member,owner,trustee,partner not reg,deploying unregiy security officer ..

- training requirements : director ,member owner possesst of grade b manager in possession deploying not regulation ,training ..
- training service : exceeding classroom capacity , unlawfully combining students of different grade in one classroom faillure to comply with minimum training standard , faillure to have necessary facilities equipment and aid for training faillure to keep course records ,faillure to submit course report authority ,training institute not accredited ,offering training course for which instituts instructor not accredited ,instructor not registered or instruction registrar ..
- uniform faillure to ensure uniforms conform to regulation ,13 (3) not carrying I'd card indiviy ..
- wage payment : faillure to pay prescribe minimt wages faillure to pays

remuneration salary faillure to pay legislation cleaning allowance ,faillure to pay legislated nigtg shift allowance ,lay a complat with ,,security meas person who rendered a security service reward fee benefit ..
- deoendi on the matter under invest the standard period to finalise any complaint is 30 to 90 days if the matter set down includ prosecut .
- average number of complaints received per month ..
Number 0 to 189 ,29 day shift per month..
- number of incidence 19 days to 69 ,feedback,general complain grade ,corruption unethical
_____''_
Digital : last updated date :
- 12-05-2022 ,
- batch number | company psira | type | statute

- batch - 383731 | 28-06-2924 engat ,pending

- batch - 383732 | 29-06-2024 termination pending ..
We appreciated takin register account successful been created
- logged in as : security oft fiston in progress :
-crs status new application : ,psia status inactive ,app no ,6163228
- creation date : 29-96-2024 ...
In order process Pre assessment ,
Last update date | description
- 29-06-2024: reg request submitted ..ticke has
I'd 117354 has been closed ,,
Job career psira ..new position ,personal info ,contact details,educational qualification, employment history,contact ,, resolution
- communication,exc,facilities,finance,forensic,humain capital it ,Las enforcet legal registration research ,supply chain ....
Assistance inspector R 336618 basic salary graduat certific6 diplomat in parallegal in paralegal coupled , candidate job may be consider during the selectt process essential criteria ability to work under presst ability to interpret pieces of legitthat manager low enforcet ,very high admnistratt skill in ludd planing monitoring computer Microsoft package problem solving and analizing skill commerciy Nd written ability to testify during court and tribunaj proceedit key perfot area ,undertake inspection to ensure and improve on compliat received ,routine inspecty assessment infrast training centre centre accreditt etc identify contravention of code conduct docket against spp relating to allegation improper conduct as annual performance,plan advice on regulation for non RSA address telephu of standard procedt serve regulation notice on responded ref matter to the enforcet unit senior particle in joint operaty manager with stakeholder eg saps metric police perform commission enquiries bliase process outstat annual fee conduct submisst of statistical report on law enforcement activiy , modification of business inspection on the psira system capturing of information on psira database issue remain regarding

_____
You have successfully completed questy exam result ,registration grade ec,,passed
- name :
- grade :
- area
- basic salary :
- overtime :
- Sunday :
- public holt :
- nigtg shift
- cleaning
- special allowat :
- estimated gross salary : 5,322.(
* Bid cdocumdnt tendered supplier chain management
- bid description : physiy security for month
- bid number : € RFB/2917/psira
- closing date : 08 March.
- closing time : eb09h0/
& Open time € 11 h00 ..
- NO € Name of compai

Tendered published on
- tendered number : tfb
- tendered description :
- award to : tshingombe
- amount : shift 100 month ,3000× 39 days , 15 years ,, level 4 ,6300000,+ 7500000
- ref matter cost order :..
- CVS 6 years expert 5 points 20
80/29 ..PS= 80(1-pt-pmin/PMI)..
P= 90(1-63.000/-600000/60000=
- capacity under which bid is signed security safety general.
Totaj bid price :

- private security industry regulation autht ..
- clearence certificate in term section 23(#) the private security indusy regulation act ,2001 ,act no 56 if 2901
- particular of employer name of five or service :
- country
- particular of former employer : ..
Date of commencement of employmy : 2025,,22010
- date of termination of emplot :
- rank at termination service :
- capacities which employed ..

- *reason termination of employment : ...record employment position and logistics security officer record posting
- reasionment particulars of any misconduct by former employer charge of misconduct,penalties imposed dates and other particular : guideline career misconduct notmak no fault poor work perfy new rules duty attandance registration cancellation bargaining supplieb no registration compagny ownership not agreement pay ..
- if there were disciplinary proceedings pending against former employer at the date termination of service factual on merite of charge and whether any termination of service occured to avoid disciplinary is required : the order occured service
...

-**2.1.6. Project :**
- south Africa humain rigth Sahr ..
- hello dears please find my completed investigation in your office thank receive by security street work find ..
-complain form .
- complainant ' s name : fiston
- complainant surname : tshingombe
-;complainant date of birth ;10/11982
- complaints race black complaint province
- complainant email
- complainant telephone
Complain tel
Complainant s preferred method communication :
-complainant contact person
* Details of complaints :
- date of incidents : 14 /07/2023 it is happy yes ,incidence province ..
- incident town city : jhb where did incidents happen where did incidents happen do you know detail : yes person first and last name : tshingombe

- complain provide fund trial court labour Ccma fund bargaining Levie Ccma vs tshingombe college matter dismissal skikk development job nated exam dhet complain figtgi ways college nogada with people break time table exam irregularite and no order coming printer NN diploma development no printed diploma .master dismissed aware saqa finalize with master degree diploma buchellor discovery and no granted certificate N1,2,3,4,5,6, NQF 7,8,8; nogada sa pension fund and bargaining provisional not granted exam external internal no St peace claim record years inteeligen e investigat

no problem ,, school n diploma Engineering electrical no play job work exam and Afric institut police job matter was constitu appeal petition rescit ruling Ccma award ruling transport bargaining ruling case jr 2461/15. .. dismissed refuse order petion not grant review nogada process bargat provide with no coberay basic salary psira car guard psira sapu perusal deduction deceassy reason report nogada figtgi exam with gun for trade theory and authory public
- security nogada employment was working inspector check site and report witbt security nogada in court jr 2462/15,,ja 37/@9 ccm gaek 6068 provide fund was requested for dismissed office order court judge clearencd psira national council bargat was request for dismiy order court judge record clearance psira agreement in nogaday security officer patrol student in exam gun career city power security officer exam was irregularity order labour uif pay department high was for statement certificate for high diploma sucepty ..,,sebongile multeane dear what you proboni org attorney for assistance

Proboni.lrg pro law,,SAHRC rigth labour rigth argument. Mandatory public constitution low legislation rules matter rigth outcome. Agreement rigth DOJ Ruth development system. Pro bono

_____
-;thank buhle Shiba :
- to complaints ,
- good day
- thank you four email below ..
- should you not be satisfy with the sherriffs service you are guided to guided a formal complaint against the sherrif with the south afriy board for sherrifs in order for us to investigate you matter futhurer .
- kindly follt the bellow procedure :
In term of section 44 read with regulation 11 of the sherrifs act 90 of 1986 a complains be lodged in approprr form and any complat accusations or allegations against any Sherri shall be in form a written affidat stating the date and time of the incident the name of the Sherriff and the names of any eye witness to incident and shall be toget with any corroborative be lodged with board as may be practicable after the incident ..
- futhermore the allegation of misconduct must fall whihin the ambit of section and code of conduct in term section sherrif act 90 of1986 for the board to investigate same .attached for ease of reference in addition kindly all coresponde docymdbt b,,sabfs

- ccm on line submission EGAEK0222008041 arbitration request ,LRA form 7.13 Cass number ..
- goodday,kindly see email below for attenyy ,kind regards ,on line good please note that court order that we have in our records state that the review was dismiy that simply means the judge agree with ruling of the

commissioner ,regard Lerato Mhlanga
...

-Project:
- Office of the chief justice (ocj) complaints form
- name and contact details of the complainant : tshingombe
- nature of the complainant : rescission ruling outcome labour court Ccma case number jr 2461/15 JA ,,37/19 council bargay union police non resolved granted review in labour petitiy low ...
- if the complaint is about court officials the name of the court officials is if know jhb. Court.. officials jhb labour court ..
- if the complaint relates to a vase pending in a court please provide the case number ,,,jr 2461/15 ,, Na 37/19 .
- background and history of the complaint : complain review notice .. petition rescission ruling outcome Ccma labour court notice motion DOJ on line non resolved humain rigth. ...
The completed complaints form ..officer responsible for the implicate court or to the national complaint

- the complaints officer in the office..of the chief justy ocj acknowledging receipt of your email ,please be advised that that according to ocj complaints management policy complaints , emanating from the course are managed by complaints officers in he courts ..
- we are theregy referring your complay to the complaints officer at labour court ms thusile Nzimande ,, for feedck on your complaint we request that you liaise with complain officer kind regard ..

ms: hlayisani muleke ,,judicial policy and research ..
-

- my civil case ,your online case create news civil..
-Master of the court service ,,
- court services
- maintenance
- protection order
- status tracking
- appointment booking
- Querry management .
- profile

* My civil cases : cases I created :
Civil : • service type | case type | created | case statut | urn • manage ..
- tshingombe tshitadi | civil law | civil | pending docy review ..
- tshingombe,
: 10420224CIV004539,,
-1042024CIV004511
-112024CIV000013
-112024CIV000012
-112024CIV000015
-112024CIV000009
-112024CIV000008
-112024CIV000006
- 112024CIV000007
-112024CIV000005.
- log query or complaints
My query list
-DOJOlinest deceased estate ,ICT / system related. ,deceased estate application Latha mullapud ..
- re : application for protection case , no 02/2024 on line application..
- sekgobela juda , to ..
Good morning ...
1.this serves to inform you that your on line appliy for protectt. Order has been dismissed by presidy officer the application was dismissed on the grounds ..
- affidavit is not commissioned .
- there is no act of domestic violet in your application...
- please don't hesy on contact us in the vent you seek futhure information ..
- regards ,
- mpanya pheladi ..good morning ..please note civil online is not open for your area please approach court for manual issuing ,kind regard , pheladi ..

-

...

- Assessor application edtp- AS- 000006376
- dear application was rejected of statement of result scope etdqa..
_____&&_____

- certificate of independent Bid determination ..
1. This sbd

2 . Section ,4(1)(b)(iii) of the compety act no 89 @998 as amended prohiy an agreement between or concerted pratice by firm or decission ..
-;treasury regulations @6A9 prescribed thaibes that accounting officers and accounting authorities must take all reason step to prevent

_____
- certificate of independent bid determination ..
I the undersy in submitting the accompt bid : renovation for relocatt :
- in response to the invitation for the bid made by :
- nogada security service ma labour ..
- I certify on behalf of : tshitadi fiston tshiny .

- I have read and I understand the contents of this certificate ..
- I understand that accompanying bid be disqualified if certificate found not be true and comply .each signature appears been authority bidder to determine the bid ,purpose of this certificate submit a bid ..
- the undersign ..
- sign ..
- name ..
Name ..
- position in force or service :

* Labour department salary schedule for
Employees I'd number:
- employee's initials surname : tshingombe
- UI registration number :
- company name :
- period of service :

* Period | salary Freq| salary amount | total hours worked per month | UI deduction | contributor non contributor ....
Compagny stamp
- 2.department of labour reg as a work seeker : .
Please personal detayj   ,access ,,
- contact detail lersonab
- Education and training general education and training level school quat..
-
- subject | school subject | grade | %levsk| school subject | grade | % levdj ..
National diplomat ,bachelor ,professionej post master doctoral.

Education. And training hight and training and short course ..
No | qualicafition | institut | NQF levej | year | status

- employment history :
- training panel pratice panel wiring job skill devet ,training ..
- duties : learner pratical conduct assessment leer grouo ..

- type of employment : performent ,note reason for leaving : dismissal resign promotion ,retrench medicaj condition ,employer ,transferred ,pens ion retirement ....
- *unemployment insurat act 63 of 2001
- employer declaration employees for the month of ..
- information to supplied in term of section 56 (1.3) 13
- including new appointand termination of service ..the employer ..
- employer ref no ..branch no ..PAYE ref
- trade name of busiy ..
- a surname | b initit | I'd € total gross renumeration paid to emoloye per month | total hours worked during month € commencer date of employer | termination date | reason for termination code applied | indicate whett contributor yes | | if contributor ..
- descriptive : employer authority ,remuration means actual basic salary plus payment declare ,if paid weedy convert wage to monthly weekly wage x52/12 ,
- total hours worth actual during month only ..
- templray employer ,learner in term skill devet act ,employment ,employee whoi are repatriated of their contact of service no incoe the paid rok ,employer
- unemployment insurance fund : bank account ..name account holder ..name of financisj instityb

- unemployment insurance act 63 of 20201

Dol. Coid ,compensation health injury in iden e occupation ,work. Award insurance ..
Instead consumer award document ..not meeting aware document consumer protection. Work not legalise proof .... ..

* Certificficate of service :
I tshingombe of tshitadi mKangu fiston .
- address ,jhb erea Mitch ..
- in the , foundation basic ,level maintenat protection parking conduct code rules parking ..
- declare that : nogada   car was in employmy ..
- from ,20@9. until as conditut good condity work security officer trading car watch car guard cts. On termination of service was earning 70000 ...

- project ..
Metropolitan police.
Mil .intellectual property book
MIP - 329-24-0100-000
- request an intellectual property IP license ..
- MIP - 318-24-00-00
- date : 27 June 2024 time ,10:06 reporting ..
- request an intellectual 27 June ,,
- 319 - 24-0100-00
- quest about using the met s customer copy MIP - 318-24-0100-00 intellectuel property IP license , ..
- on line submisst foi - 15546 - 24-01000-00 ref number is 01/ foi/ 24/0308814 triagec. Data rigth ..
- action user taking access integration ..
- 01 foi | 24040337/k
- ref foi 22728-0100
- completing ref ccr - 11259-24-0100-000
- CNP - 53345-24-0100-00 crime management. Service case crime ref: 01/0000/24,,,, 234565. /24 record system incident logged 2024/06/23 ..
- 27 June 2024 ,, FF-973-24-01000_ FFC step back ..
- how much use traffic count by project view ..https pro - UK online tableau ,site status view work total view tableaux work total view count by time view count 1- performance review executive ..pipe ..
-
Outreach ,,Foi-22728-24-01000,, MIP - 42-010...

-Block mark training.

- academic Scotland,,
...

- ***2.1.8.training and dey training for police community support ,officer (PCSO) provide you with knowledy skills legislation powers to enable you to carry out your duties including first and personality safety as PCSO training is a month the most importy tools at your disposal initial training appointmy as PCSO you begin with** ten weeks of training to Monday to Friday
*,,introduce you to met and to your new roles as we as well a helpiny your build skills .
- radio procedures ,effective patrol report writy dealing with with evidence gathering intelligence managing a crime scene entering premise use force ,communication skill and problem solving human rights safeguay and mental domesty abuse missing person and anti social behaviour diversity awareness and road checks and issue of fixed. Penalty notice ,health safety and risk assessment public and personal safety ..
- emergency training test learned results on test overall performance during course shift (0700-1500) or week public personal safety training , successful basic command unit return ..

-**2.1.9.. 1.overview : discovery what a PCSO rewarding work you ..**
- 2. Role and responsibilities learned different type of work doing ..
- 3 location and working hours
- find out where can you work can do .
- 4 life as police community support officer .hear stories from serving PC's ..
- who we are booking for find out if you meet our rligibiy .
-7 0ay and benefits : discovery wath you 'll earn and the perks you can enjoy ..
- how to apply : begin your applicay her ..
- completed step ,2,3 selection assessmy day and Pre employment grade ,Pre employment veting pass interviews:
* Police constable entry : program ,
- step on line registration and application ,on on line assessment your met assessment know day two ,Pre employment vetting ,offer of employ into oc ,,

- outreach successfully ,placement student graduate ,, Portofilio , student Engineering build , traing.

...

-student placement accredited financial investigator .
- number of vacancy .
- location band full time ..
- 36 hour per hours contact .
- duration 12 month..
- student all roles valuable .
- interest in financial crime development Ther analytic investiy skills to assist seizine committing most ..
- graduation from students ..
- economic crime command ..investigat fraud laundering ..
- essential role experience work team collation knowledy skill...
- student placemy real estate development programme support role ,assisting office financial project .. management Portofilio project .
- communication skill .
- planning and organisations skill .
- time management .
- problem solving skill ..
- technical skill TT skill .
- team working ..
- personal responsibility
- professional ..
* Student placement estate asset management working organisatiy our internal client team knight ..
- coordinating undertaking land. ,team working ,personal responsibility , professional ...
- working out rent review and lease ..
- Notting Hill delivery team largest planned annual police ..operation coordination land ..
- business rate council tax attending month rating strategy asset may annual asset value insurance value ..
- attending and coordinating cooperat ..
- effective :
- student placement constructy and buildings engineering.
- managing project client police scope ..
- Understand plant ..
- basic understedit change buildings plan relation use visualisation software ,Artemis budget.
- senior computer networking engineering
- return schema retired office ..
* Students placement Portofilio office
- permance analyser media counciliation
- junior technologie eny construction built analyse research data crime academic DC intervention ,equality impact assessment grievances assessment director insoectort review
&_____&&
* Title • |. . status | action
Technical intelligence exploitation and development programme

- expression of interest withdrawn ..
Met recruitment team : 12 :05.
- dear tshingombe dear tshingombe..
- you have successfully withdrawn your record of interest from our system if you ve decided this isn't the role for you but re still interested in joining the met please take a look at the other opportunities we ve currently got available you can view our careers website here ..many thanks the outreach team ....
-;online form submission MMH-3910-23-0100-000
- public hearing@ met .police.uk
- dear tshingombe,,we regret to inform you that your appliy was declined there is no hearing on that day ..
- best regards ,on behalf of the miscondt heariny unit ...
Submission , official - sensitive ..
- conditions of entry : I confirmed that have read and agree to abide by the condition of entry ..
- your details ,
Fist name : tshingombe .
Middle name : tshitadi ..
- surname : tshitadi
- date of birth :10/11/1982
Post code
Irvine from ..
Telephone- are you member of the press ? : no
- are you a wheelchair user : yes ..

-:do you want to attend : one day ...
_____&
Tpmail cribvicfimcommunicationmet.polocd ..
- good afternoon :
- thank you for your online submisst I have looked on our crime reporting system and crime number you have provided below is not curret showing any Cass please can check the number and get back to us and we can assist you further..
- please do not reply this our mail box cannot receive email directly from members
- to : to mailbox CMS cc ..
Subject : online from submission cnr - 50615-23-0100-00
- official sensitive :
- step1
- first name : tshingombe
- surnat : tshitadi
Date of birth : 10/11/1982
- email address : tshingombefiston@gmail.com
- postcode :
- origin : from
- crime ref number : 2365983/23

- **2.1.10.project**
Integrity defense and presentation university College work of work
University institute College education technologie integrity :
Research :

- development justice not deal on line court issued provisional not on line DOJ process matter on line the process matter only decades on line labour bring to high court files after crime after job labour keep bargaining why where is alone keeping didnty open case and leave on line where is student where is police it wath political wath commission
- justice is court is not Education is not assess not policy things Education rigth ,education low ,education labour college of work
- justice Education civil civil civisme education citoyen droit rigth and low covilt disciplinary information on line low is not Education respond for evry body must work there charge no leave it correctional ..
- education labour education relation labour Education justice development low discovery Education theologies pastor apostolate disciple master religious educat technologie.
- Education labour Education relation Education justice development low discovery education theologies pastor apostolate disciple master education technology education technology education life orientation Education technologie technologie Education life orientation Education guide police lawyery pastor do there job but the teacher low governor administrator teach government commercial low teach item inspector the teach in site of that job is not like other job is those job phylosophie litteracy job the teach art job is table the learn low to present but is not Education pure in to present but is education pure in the church is no eat school in site for church is school political duty is police militairy first class semester first grade but is not school the work soldier police office first grade level parade in instructy book but is not school is rank class the teach discipline rules low government lowyer teach matter is legislation ..
- Education undraggogie education citoyen agent de l ' ordre premium first class class police rank class in defense instruction civism ethic deintologie moral edy Education technology education technology artisan policies inspector enseignant order public class policies certifie copy government certifie licencier administration registration education pastor enseignant biblic apostolate theologies course the teach after police do author service judge after job lowyer e low do author service judge after job lowyer teach do author job low for lower teacher also InSite make low after teaching reverse
-;artist teach portal career job after design the presented art dramatical present musical not sculpy presented the teach first education reversed pedagogie art of education and teaching board design school discipline process phyloy logic political.
-in education pedagogie the research against teaching didactic the research spiritual miracle in police the research justice low natural observed not teach mean but teach ..

- those product is not qualify is prep manufacture artisan street small not for high standing competition rural copper ,,in dr Congo. Iturie kisangani,Colton small people not high market ..
- motoring recycling casque Bleu unnunited nation belglsndesh society civil vs casque Bleu copper industriel mining foundry agency industriel rural Katanga mbujimsyi is not rural is exist there is that one diamond is there..
-
...

...

-**2.1.11.overview library research book recording process :**

*** Grant proposal : non profit proposal .**
- date submission ,grant name submitted to asresss ,grant name submity

* Request for proposal template :
Research saqa qualifications final award certificate and final award degree diploma ,award master degree honour bachelor: circulum dhet nated ucpd transcript record academic bachelor's
Supplementary and continue saqa nqf 6,7,8,9,10 regulation and irregularity back log issue repository.

Rep. Proposal. Compagny

1. project overview:
-1.1Abstract : overview statement national system examination and qualifications system framework regulatory overview knowledge application and finalise with system rural land reform council quality control process on high Education system and university system need energetically for work in the time system real and take most imaginary system energetically scientific discovt on the end day system .

- 1.2 purpose : the end overview for counciliation system commissioning system arbitration , statement national load credit and accreditation booking journal inventory delivery not claim academic system need resolved agreement minimal wage in framework system reform provisional site situation land reform geostrategic zone sectoriaj
1.3 .topics circular research question rural development energetically scientific:
2.1 . Framework statement national system examination and qualicafition framework regulatory overview ..
- 2.3 system : case study report occured sectorial programme site rural technical vocational support frame work regulatory implementating mandatory system policy case compliance existence fundamental support municipal country continental system development task unity qualification system vocations technical system implentation support electro energies and mechanic c system support zine rural ,management system information safety security system keep zone in fire rural electrinergie in fire renewable regulatory research analyse design framework implementation and improved subject in field studies engineering examination circular integration and system rural zine protection device Cass study structural energy claim inventory ,zone rural land reform tenure extended supply ..
2.4 case study electro energetically stability and static report occured zone safety survey civil geotechnical rural sector site skill admnister communication stress health occupation system workplace skill gei target occured system occured book and delivery service bill multi sectorial rural enegie Instability system stress health skill score constant annual report implementation system requirements system requirements land reform bridge reform need to protect and to safe .evidence of the low value Portofilio supply rural. claim developm system technologie implementating antenna remanufactured system fundamental energy reason system re zone system suppt load or overload system existant nation framework qualicafition private and public sector maximal allowance capacity development ucpd to marks and agree renew no existance system iirregularity or not approved bogus in the real system existance rural demands factor cogeneration or generative intelligence syste AI framework award need to be re compensate body ..
Computerized statistical ask demographic registration limited no approved need aware system and rural system to be granted ..and re agreed
2.5 case study electro energieticalkt rurall system trainne support training support skill learner management system induction ..
Case study electro energeticalbrurak system trainne support training support learner management system learner new job and old job system resources management human investigate system electro energetically ,system stability framework regulator legislation mandatory compulsory system safer prevention rural system review existance firm joint venture existence system implentation energetically stability b...
- manual occured ,zone statiscal security severity give impact financial

requirements system rural resolution incorporated zone break down time table ,allocatt system minimise risk system..
2.6: case study energies problematic demand ,cost projection retrospective ..production management system review ,land reform view .
-resource allocation value break downmm

*__**2.1.11. 2. Project goals :**__
__**3.1 power size workplace ,class room study training ,regulation and irregularity attandance supply subject module**__
__**Outcome criteria and distribution**__

Histogram droitegre equation module axe y and co-ordinate y ,and X abdcise

Model frequency database collection:

_____
Model | variance. X1|X2|X3|X5|X6|X7|X8
y1
Y2
Y3
Y4
Y5
Y6
Y7

_____
Sum
X+ Yi = o relation module subject reason energy class
Complex value real time table attandance and imaginary time table after break relation iirregularity.statement continued

- square / linear enegie compare .
A+bi =
X2+biy2+c
- b +- sq root .b / 2a...
Matrices energeticakb..
- integral .limited continue energy ..
Lim X.
Du/ DV ...
Electrotechnical and trade theory relation ..energy support
Mid point Serie sequence value in term periods time table y module subject value in x time table continue value total grand module outcome in Engineering factor energy system .relation correlation. Means frequency, dispersion marks ..

Lineare

3.scope of work :
Topics defence factor reform electro energetically rural system ..
Fundamental : formative informative system exorurak exoneration circuit framework regulator inspector labour design system rural support reform joint venture building development system .

- factor scientific physic chemical analyse system investigation ruraj system zine complex site site mark design ..
- factor material construction dielectricallaly conductivity super conductivity ,insulator magnetic ..
XY = 0 join relation module subject argument breasin linear enegie compare equation two system add ,compare two knowledge , X,y determinate system ..
Matrices..
*5;current road block :
Research mety : land reform peek average periodic assessment trading system zone load time table ..market .. vibrators b modulation demodulation suplentairy field subject qualifications zone time table years quadrant ,kinematy value engineering science and potential generation energy field feeder ..
Vibration system real and imay value stability concrete energies value occured staking ..
Rural system linear crime statical analyse imaginai air time ,ruraj structure generation and regeneration field zone ,system comoasatir ,system emergence system balance load system .

2.1.11.6 .1evaluation.metric : semmester air time award credit balance stability 36099 second 4 module ,24 module ,36 modules accumulation variable x,y2 credit 369,129 to ,10minimum award equivat occured air time power size zone work done efficiency matter balance reject indicator poll assessessment system management clause month criter admissi 45% ,100% rats means value close criteria minimum energy design supplleniand completed phase national framework design energii supplemtaire land continue energy land system rescisst system land criteria close system overload symmetrical system manager police implementating improvi indicator manufactt criminsj rural and Energi material complain to bill delivery cost supply ..

- load central system power station generation framework regulation developm .electro energies stability transmission grid substation disconnect .dispatch. ..on the subject trade theory electrical ..nated
* Activity subject :
Modules 8 | week X| week | week| week
Y 1 ..

Tot

- 6.1.advantage field :.care maintenance system ,inspection system daily week Tom Terro technologie counter productive .module imaginary and real by deployment system combine sheet rural framework qualicafition by completed

- projection cost economic modules subject implementating delivery
6.2..Disvantage field : government non accountability by community insurance body when need to resolve things in the time is rural
System orientation criminal community police oersuaks analyse system information card orientation proactive security system protection data base detective system vetting plant in operationel correct language grammatical error design time table break down module maintenance ,induction resource management non assistance new member policy design own system goverment non fund to request complain .
.
6.3.Synthesis field ..application : system orientation design community management system design in order process : criminal record databt in policing visual basic Energi system module subject assessing police to resolve information system police policing I'd process in order to compliance framewit order community

7..
 Design system eny energetically

Gears level hierarchical word process.
Real complex imaginariry ..
Matrices
Hierachi conjugate energy mean roir cycle and recle process ..
Ball..
Serie

- design circulum nenergie assessing plant system ruraj energy , anarchy circular instut bridge relation ,ask to compliance ,entre re examin ,case non complain ,safety knowledge skill development investau under go next year's generation system time table generation and metering intellectuel artificial intelligence process
- design system metering meter sqr ..
- balanced system real and imaginary ..
Equilibrium system phase ..
Descript vl1 +vl2,vl3 .....a+bi ..z= impedance load.
Balance feeder. Ordering consumer
Energy. Conservation system efficiency and transformation system energy ..
DW.dq/ dq.dt ..q

- machinery regulatory ..labour work..

Research operationel equation function function function gradient up grade real time energiebsyatem process ribit ..command

-

...

-***2.1.12.*** NSF CAREER. PROPOSAL:

-Framework qualicafition experimental career learner work of work and labour of labour learner based
Educator trainer facilitator.base framework skill university work
Master degree ..honourable low .
Work framework qualicafition in the job industrial and in academic university College in industrial experience log activiy undertake material ndiploma ndegre log in academic learner rwiten completed framework assessessment assessor moderator explanatory meeting or not meeting transcription and qualification agreement on marks award percentage requirements 50% level
1 to 12 national framework qualicafition ..and national trade and undergraduate ..

- **2.1.11..**1.dealine : local
- 2. time framework 5 years :
- 3.limitation : principal career proposal career .
  4.Submission by: university and college. Degree buchellor doctoral distance ..
University capacity development granted marking department high education and institu record years academic work required exampte field subject .
-5 instruction: proposal and award policy (PAPPGG ..)

- 6 . minimum budget : 4000.00000 total program officer except salary .
- 6. Eligibility: engineering electrical master and education technology,education technical education engineering field ..
-7. Requirements as of application hold degree field engineer training ..
8. Previous award type : award degree diploma ,award certificate ,diplomat gradual ,award certificate Batchelor degree ,award certificate master honours framework qualicafition engineering field and education technologie field in assessment assir ,manufacture process related teacher ,technologie advanced ..

_____
-9.1 review faculty early development v

_____
Documents | require | requirements| NSF

_____
10.Cover project |yes | beginning with career
10.1 project summary |yes| following
10.2project description result Frome prior: |
10.3. budget and |
10.4. facilitator .|
10.5 senior person |
10.6 . bibliography .|
10.7.
10.8. supplemtaire|
10.9. Post doctoral .
10.10.research ..

_____

- project description :
-1.prospective research.
-2.rational .
-3 preliminary .
-4 data appropriate ..
5. Literature ..
6. Hypothesis overall .
7. Quesi research .
- description proposed education activity integration

_____
Project : supply of electricity to rural house home resident in Africa RSA
Abstract : residential sector RSA purpose grid and off gride electrification 50 watt ,solar home system SHS consumer size produce 0,3 to 0,4:kWh of electricity per day even under solar best electricity energy b basic electricity energy ..
Eileen ,,and batterie cell rural ,electrigene grouped support emergence loadshedding , Marais motive thermal ,mini hydroelectrical ..

- population 13.2 million house holds 34 % grew up to around 75% includ both formal 87%
Backlig of 3.4 million household electrified ..
Department of energy RSA Eskom operati cost from Tarrus investigat
Case total ruraj unekectrified population
= Total population × 0,31×0,62= 52,89 millions × 0,31× 0,62= 10.0 millions b..
Projected electricity of UN electricity house hold in remote rural area ..
- adjusted solar and wind investment cost (000zar / kW) ..
NASA data used RSA Google renewable grid
- installed capacity and energy balance..
- Eskom 15 .459 zae per connection is growing continue Eskom rate ..pPV base hybrid system
- inteegray energy plan department energy accord ...
Iinstuy of applied system , framework ..items .. international renewable energy agency .. message b..co 2:. layout and it's work environment b..
* Plasma dynamic generator electrode discontinue ..technot thermal ionizTor gaz discharge license authorisatv combination Maxwell ,sticj eayatiij ..ap + v = PV = 0 ..
- 17 = me .vs

$\overline{Z= |a+bi}$ | a2+b2

_ estimate wattage time ,,using kiloeFv
kW= revolution / second× kn ..

- 10 revolution ÷ 30 second ,,electric rates / rates
Ohm = V×Z ..
- P= work per of time = v.Q/t= v.× I or power = voltage × current × ampere ..
- bill measure kWh ..one average

- principle measure general electric energy meter ..kvarg
Landis and gyr trivecgor karh meter ..NV =√ Nw^2+Nr^2..
NW and vi cos flux..
- single phase induction watt hour meter for ac energy measurements ..phasor diagrabb induction metr ..
- electrolyte watt hours meter ..
- clock watt hour meter ..
* Connected load name plate ..
Demand factor = maximum dem/ connected ..
- load factor = average load / maximum load ..
Load factor = energy consumed / maximum load ..
Cakxuk demand feeder circuit .
- 250kva × 90% .
- 200kva × 80% = 160kva .

- 150 kV × 75% = 112,5 KVA .
400kva × 85% = 340 kV
''
_____
837,5 KVA ,sum individual demand main feeder circuit ..
Diversity factor of 1,5 the KVA = 837.5 KVA ÷ 1,5 = 558 KVA for feeder

* **2.1.13..Explanation electrical power energy grid ..**
Active device power source ..
-Passive device loads ..
- passive conventt .
- resistive circuit ..
- alternating current without harmonics ..
- electromagnetic b..
- production : generation ,electric power ..relation physic concepts ..
Relation very power and resistance ..
Relation between electric field and electric potential ..
- dielectric propet terminoly mechanism ..real power :
W applied = √ 3 UN ×U cos flux ..
W applier = real power .
UN= line to line voltage ,V voltage ..
I = current ,A ..
PF= cos = power factor ,o,7 ..
W applied = 3.Uin .U cos .flux ..
- Uin =™..
Pure resistive load and power factit ..circuit

- P is the real power ,,Q
is reactive power
The real part complex power is active or reaj power ..
S= P+ jQ
P= V× I× cos ..flux
Q= V× I .sun .flux ..
|S|= √ P^#+Q^2..
- cos Teta ° power factor .
Resistance ..
- cos Teta = P/v.i
- electric energy :
W= P× t ..
- quantity | DC. | AC 3 phase
P= V ,,P= √3×Vl××IL
× IO = cos flux = 3 × Vph× I× R ..
I^#× R..Iph × cos flux O = .
P = V^ 2 ..I ^ 2 × R× cos .flux O = 3 / R ,..

P= O.E.t = q.V.t ...
I= a/ t ,,Δ t = t..

P= E/t ..
P= V^ 2/R..
P= I^ 2 .Rv

_____
Hydro electric generator dam ..
Integrated concepts : assuming 95 ,5 % efficiency for conversion of electrical power by motor wath current must the ,12 v batteries of 759 kg electric car to supply to accelere rest to 25.m/ s .. 1.00 minb to climb a 2.00× 19 exo 2 high in 200 Min at constant , 25.0 m) speed while exerting ,5.00 × 10 .exo of force to overcome air resistance and friction .to travel at constant ,25.0 m / speed exerting a 5.00 × 10 exp 2 n forcec

-

...

-**2.1.14. projection: energy rural supply suport:**
Life cyclo longer gid comparative life equipment solar rurale to grid national support Eskom and municipality system goverment life cycle recycling material
Project cost : panel batteie mining ,coil material and steamer growing in market challenge 59% rate estimate rurale sector growing solar and cell , energy gride real 41% time load shedding estimated value ,, usage .marketi ng
Life cycle : regulation system integrity
- production sector financial and industrial bank of database telecommunication sector and private sector industries computer and bank data recovery and security rating sector claim communication I'll energy and bank shop economic accoutability energie electrical in stereo binary synthesis bank memories and database sector rural charginging cell batteries cellphone and solar central rural Bank telecommunication recall electromagnetic EMF,,,..bill. System baterie product electromagnetic and as auto recharge recreation automouse system regeneration recovery energy system rural sector red to be accountability...metering system re metering bill recovery phenomen.. database..
- projection ..life 2 ah 50 h 1 days 1 years ,2 years recycle rural to life 10 years 365 days years ligth ...life cycle material stability..EU system ..
...

- 2.1.16.project summary :
Requirements:
-2.1.11.1.1 topics oral presentation assesst test
-**2.1.11.** 1.2.introduction : learning Engineering electrical thing about : professional and council engineering rules council education ant council trade training College and high school qualicafition Saqa degree country's SADC UNESCO organisation international Framework according support a protocol legal phase service sasc .learner actuaj tshingombe integration b in college high graduation diploma ..
Tiopcs business | mark | remark
Oral confident eyes movement ,
* 1.3.Abstract: development project CVS present art work superior Polytechnic professional serviy Education award degree council manetaey files pocket wallet , read book Engineering e trade text book homework class work framework studeg .
*1.4 . modelling assessessment for.engineering electrical time table allocation project engineering : foundation system degree saq control submission task policy course syllabus lecture note assignment .project ..
- 1.5:
Topics and activity | material | daily
Lecture note field qualify engi phase fundamental ..
Couser credit 110 award ..
Framework :
_1.6 ..framework precise warn saqa policy claim non complain subject in RSA ..
- project preparau to ion ..
- framework adaptative : management and educational high college no agree saqa official grade statement 1 the degree ..
- Cass studies of models and assessessment in policy saqa : ..
- 1.6.1.topics assessment and recognition of competency :
* Documents | latest version |™.
*'training schedule policy state delivery learn the delivery : leader in the emergency response recovery certificate award learners register accreditation files selected ,subject policy criteria award no meeting requirements and aware for experiemental Portofilio finaj record evidence ..
- self assessment
*1.7 model comparative module criterion pratice industrial electronics . Module fundamental ,phase .: completion
1.8 ..topics facilitator critical discipline: labour applicant compliance circuit respond circuit health :
Applicant wire explain Eskom lecture assignment ..learning Engineering outcome assignment policy sabs judgement outcimi safety sign red with

green meter switch judgement in case compliance 50 A , explained kWh = responder applicant 250 / 389 argument respond policy sabs assesst interlock overed 39 v ,penalty 25 application dismissed policy amendment compulator found factory..
1.9. applicant safety preventive :
-Breaker ,, responder prevention security circuit switch ,,.bulb learner load
-applcant preventive safety existance .
Safety ..
- policy patrol coverage ncv nated level existance circuit load ,wath haooend ,Va ,VB,QA,qbcharge discharge ..
* Coverage enclose polici safety Portofilio log inspection equipment earth device tested regularly log book missing cover base connection over load , short protection device founding leave judgement ,conductor high power reason over power submission..
Transmission education ,resistance R, area accoisr ,, resitivit ivitg ..load circuit
- inductive circuit load learning
Capacitance circuit switch phase circulum ...impedance load series paralleled in time table..
- active passive. Phase circuit. Rectifier ,,and transi to kire amplifier circuit system phase circuit framework qualifications diagrams entry and exibith field magnetic bell system measure instrumentat.. batteries

2.1.17.Topics. Project : create found circuit ,cell 12 , 12 total circuit wath happen circuit ,found wire mm, 2,5 found ,found bulb ..
Research search circuit parallel increase decrease voltage capacity label draw develoy switch switch inter commect found present ,topics
- introduction : learning project theory test and class cekk and batterie important understand if cell circuit batterie important understand there not really a resistor always bigger ..
- research parallel ..
- advantage ad. Disvantage. High internal resistance. Low resistance high efficy 99 % invidiak therefore 12v
- specifically power : tools switch off charge over charge , discharge explou
- topics : training learning m college modules semmester 70% praticajb..
* Analyse exam | reproducty | application | analyse | evaluation | discovery investigation planner ...
* Assessessment plan guidelines outcom topics commissioning
* Label advantage manufacture
...campare .
Current
Self life .
Physical
-research current. Phase circulum network , equation proof number master ,tutorial lecture basic subject posted guard explainer teacher institu instructor memorendum exam proof grade tutor learning ..consultant

analyse ,operational .. asssessment ...diagnostic : logic calcul numerical psychotic ..sumoli fraction switch contact algebraic ,X proposition power n variable x,n proposity conversion binary bass binary decimal hexadecimal logarithmic diagrams ,s1,S2 switch.rectified amplification outcome module equation switch simply binary switch 0,..
X ^ n , y^n ..log 100 base = 1000 conversion base decimal ,, switch expon log 2 base 2= 4. ,,,sequence. An = an + 1,,an-1 impulsion button. Control current relay delay phase circular switch. ..on phase transition week time table. Log activity weekend.7 day log 4 week base month years ,,log book time after minute clock modules circulum degrees angle watch grade translation rotation phase ..
- psychoy calcul measure draw master proof .explain give low equation correct..
- motion note teach grade 12, n3 1 Mont 60 day
- topics : coil of relay is wound wire which has resistance
...

.**2.1.18.**
2.2.project summary: memotech trade circulum phase exibith outcome award
2.3: project discretion Motion
Trade basic theory fundameybcinstrution operationel trade low rules applied skill to skill , code practice safety tools rules plat building injuries .warning ..
- cekk advantage construction simple efficiency ,trasfob..open air cooling transformer ..
- rechargeable greater capacity than primary cell ideal emergency back back application get ..
- code colour resistance ..
- Engineering bdrawing : PC aid join metskk arc flushb..
- trade domestic appliances b..
- electrotechnical ..
Framework qualicafition
- pratical purpose saqa to isat integrity :
Pratical purpose topics and monitoring grinder machine produce .
- sub task activities time frame .
- quality framework equivalent assessessment framework : national engineering credit accredit policy minimy maximib...geodesie 1/100 ,1/19 project ..
Log book instruction programme national level calcul evaluation credit entry credit exhibition outcome years /) evidence experiemental 3 years equivalent comparability psychometric calculate time table ÷✓id calcul NQF level credit 369 credit qcto grouo evidence grouo qualifications ..
- 6 years ÷ 2 years = 3 years equivalent framework job ..

Framework handbook : quotation intellectuel credit 369÷ credit ..180÷ 2 credit award percentage evaluation 50÷ 100= 2:levej ..
- work where appry a applying lubrific correct assembly to assembly in accordance with specific standard operate ..
- where approt applying packing and or sealing material in accordance with specification operate ..
- inspecting and checking the final assembly for conformance to specification ,1th ,2 the
- where appropriate returning final assembly to use 1th ,2 the, 3 the ,4 the
- diagnose and repairs analogue equipment and components date
+ Qualify integrity undertake material labalk cable conductivity resistivity therm copper insulation correct formula ..
Resistive x length accross section diameter , modules young plastic.
Gaz ..permeability
PVC .appropriate job
Process manufacture :: tools hand. Wire color cable type make coaxial ..
Mounted ..
Diagnose and repairs ,obtain and followy circuit Manuel specific schematy locating reading recording and diagnostic build in fault .
- obtaining error interpretation documeybtest functy and recoorging fault and equipment build test checking .electronics equipment SB assembli..
-;removiy and replacing componey .
- recording results test undertaking electronics ..
- isolating electronics assembly power adjusting turning cabling electronics equipmy..
- returning to service skill to provide brief report record result test ..
- retiring repaid maintenance lock evidence ..
- look evidence error code interpretation documents runnitb checking job chart equipment related procedure interpreting ..
- undertake numerical operationel geomey date sign check material exist ..
- making termination connection to specific manufacture and regulation adjustable marking tagging and calling wire conductor and connectiiy .to specification .
- connection using languay and litteracy skill to complete and routine information test electrical ..code trade
Job specificat pertaining system operating and relevant personal responsibility..diagrams..methodology..
- method resolve equat ..no phase measurements evaluation 1th ,3 the fault low Kirchoff find cuurdnt evidence circuit diagram label ..equation loop system
- quality : ekectritechi : mounted and wire control package evidence requirements apply labelliy numbering to cables using terminal in accoy industrial occupatt health and safety ohm and work deal unplanned procedure ,select switch heard and contrik wiring ..
-;understand labelling labek code no metak conduct body partie man insulated conductor size GB material ..

- Qualify criteria score description tools ,excellt terminattb:14- # two insulator ,14 maximum 600 volume ..underground cabler feet ins walk in burial ground ,s,X nylon synthetic rules door ligth burrier PVC ..low maintey relate .planned measure ..
-;diagnosty and repaired documents ..
- procedure component appropriate approprit system director manufacture test review and approval report responsibility DC number priority routing ..description drawing showing where approprt procedure charter list other applicatbgiemetryband calculations formulation objective. represented drawing action to understand in response material from which the object made hazard base assembly drawing us identify work relationship contain drawing provide compagtbexposure diagram ..
- schematic assembly drawing picture machine..
- manufacture inspection contactirvfinak inspection

_____

* **2.1.19.**Result from :
be aware , ratification

...

-saqa verification letter call center all note centre ..review and process ..far all information related to verifying sith Africa qualifition please turound to process and completed the verifacy letter is 25 working days ..dependency on third party verifactiin may effect the turnaround we appreciate your patience ..
. accreditation related , general infoy for leaders , database of accredited assessessment centre database of accredited bcenyre .wcti .. assessessment btest related information for assessessment .certificate verification , accreditation ,quality partners for skill development provide .. release statement and finalize award diplomat iirregularity case re marker
- inquired Davide thaga enquired is not cleared. March 28 ,9:9 19 : 2024- 20
- acto ,12 please not the Qcto does not issue any statement of results you need to contact the training centre..

_____

.1.20..
5. project rural sector agreement
Work of work and labour of lar in trading experiemental base supplier:
Theoretical and practica
-**2**l
Application
Scope:

Title : CVS government and Education job Engineering college ...

letter cover letter and research on job ..sectorial

Gov mineral
Topics ..job department science and innovaty socio economic development ..
- programme..
Adminstrat technologie innovation internat corporation ..

- programme research development support : lecture and learning development under planing department educat vs saqa vs qcto vs seta researche resolves time table examination assesment police portoft documents system integrity policy academic ..
- purpose innovation theoretical science technology national trade factor outcome time table trading examination and qualicafition framework national diploma n eny and council trade sector innovation system outcomes empower system subject entry phase learning and lecture teach science exht generation technologie assessment police ,and engineering asst trade machit and trade control syst process project system control evaluation ..
- knowlegt innovation pratical theoretit trade technologie electrician engineering electrotechnology empower value are recreat orientat maximum value tax return ..
Completed research libraries system technologie value entry lecture exam nated vs framework vquakificatuin ,, linearsue system electrotechnology power fundamental job duty job maximum job value minimy trade operationel task minimy components system

-5. 1
description project : control electricak career project officer iutcim engineering gov city officer outcome a legislation goverment gov city yes ..
5.2 . Abstract job work career category job skill ,yes ..
5.3 ..entry engineering electrical trade insfracture implementating support yes
5.4 .purpot assessor yes..
5.5.. case study how make calculation for distribution substration
-5.6 requirements purpose and requirements advance basic ..
5.7 . Requirements power station and central system appliances TV reliable yes
-5.8 requit power station and central appliance TV reliable yes

-5.9 requirements dimensioning workplace .yes
- 5.19functionalite principal : note office Bureau sabs ECB Realty calcul ..test

-5.20. requirements domain application distribution network..

-5.21. electromagnetic induction to resolved problem ..
-5.22. requirements energy dimensions .
- 5.23.rate discharge need adjusting energy determine..
- 5.24.required energy dimensioning

- diagram logigrame algorigram..
Initial start ..impletation circulum knowlei circulum policy engineering planing product improvt contractual e a registered and consultant electrique computer yes..
-5.25 purpose factor career outcome transistor phase learner phrase .
Method materials and equipment scientific guidelines assessement for Learner and teacher time yes ..
- 5.26
Conclusion and discovery computer training and support services to existing or prospective

---
6.1 value asssessment saqa vs NVC NVC nated insfracture ..
7. Purpose dhet Education career bridge statement base phase job psychomotor,yes
8.dhet vs sasseta accreditation mill STD safety training merseta required
9. Purpose manufacture relate theory pratical competency equipment trade ton max chain load diameter trade code objective credit theory vs pratice test manufacture yes..
10. Purpose dhet national electronics fundamental Engineering level and license trade trade engineering.comparw test methods notion Hopkinson..
- purpot wiring electric way premise protected line fire ..
- 10.1 purpose engineering science module completed algebraic linears foundamentsls system process analyse ...purpose instrument measure trade ent a measure controle lab ..
12. Dhet vs saqa pratical work experience lab workshop industrial trade purpose machine manufacturers .
-13. Dhet ncv lecture vs saqa subject electrical principle NQF level ..
14. Purpose dhet and vs seta sasseta skill programme management electronics asssessment threat for installation..
15. Purpose student information system manager system revolutionary and strong which cost interactive collected..
* Projection design analyse : project principle ,project diagram labelled schematic ,project diagram power circuit ,project commanded control way ,project experiemental measure test ..
- diagram alorigrat diagrams ..
Concept design Plano grammar algorithm ..
* Initial sequency implei ..
- purpt of plan dhet yes .
- key switch contact .
- aim of plan yes ,objective plan yes ,key delivery yes .purpose ...

- 1.2 basic science infractuy implementating of researche innovation mission equipment college equipment framework theory praty lab workshop impli departmy gov systt more ..
InovTion ,incenty meeting ,
- national energies regularities of South mandatory electricity incitat minister electrical conformance ..
- project ..high school theory Pratt week grade theory lab workshop ..
- university theory pratice work lab ..
- instituts Case study research
- job duty system value learner lecture framework qualicafition and occupation trade job ,salary resource human maximum fiscality minimum technologie components system .science natural service requirements trade sector maximum sector electrochnology . components..
* Value financial tax system :
- strategic , phasing modules tasking circulum system implet levek grading lecture..
- objectivity the trading lecture and learning system engineering sciet electrical subject technologie electrical electronilogy education technology.
- system outcome ,trading education technology systt power factt demands system Education efficiency system assignment power objective module task ,maximize inventory..
* Devevt humain generation system teach sector organisations technilogie rate value maximum rate factor admnise value ask requirements system value ..
- component trading lecture used compai manufacture related system industrial educatt system intelligence management system information Education computer contrik system switch and mayeriaj commands. Component manufat .numerical time table framework regulatory education trade relate guideling

...

[

.
NSF career proposal ..

Work of the work college operationel trade in trading business society
And more to work of the school and university student visited on overview engineering telecommunication

Base
Allocation notes ..

*Rural energ
2.1.21,
7.1 project :
Scopes
ies

_
Title :research college engineering career joint gov compagny department implementating time table framework ,college to compagny electrical engineering love.
Eni electrical implentation time table to the job time company experiemental trade

2.1.21.7.1 ..scope research implentation framework study trade theory pratice engineering studie time :

7.1.# abstract : knowledge student case study Eni design analizing investigation field tendered time table trade ask factor in compagny overview in city power research experience trade theory research training knowlegt city municiy job Gauteng city approved in power electrique metering house basic : join venture commissioner b , ..
7.1.2 purpose overview in developing compagny tendered city power supply : Engineering electrical case study..
- requirements : eny electrical integrity time table licde pratice trade theory ..
- 7.1.3task:
Ask answer theory pratice .

Task : ask questions power to integrated sector training was satifat CVS to gate information power city meter customer ..need to trade customer outcome technilogie modules trade : theory Education technology trade Education circular customer metering service energy ..
- step

7.1.4.. operationel preliminary case study visited operationel : permit work temperature..
-7.1.5 permit minimy job career student security in BT's training allocation minim job : sociaj work ..
7.1.5 : question factor ask new student was not allowed to trade in plant to be training.
Workshop library training

..
7.1.6. Ask / answer factor permit ,,: physical security close tendered. ...
7.1.7 ..CVS student city power and training trainer to delivery bill information integrity job .....

- student asssssmy work shop class work home research engineer project .. Govermy system nationy find imolicay in system exam to sectors developm sociaj union srudeb. ..
7.7.8 metering module trade theory electric ekectritechtnologie reassemble instrumentat measure information communication skill mathematics engi outcom engineering electric
- provide information established in city power and college St peace electric : kWh ,compare result visited investigation metering.

Time table domestic appliance .

- requirements appoint of plants eny electrical consuli provision service ..

7.7 module induction safety hand tools conductor recakk section criming soldering fault find ..
Code ..
- engineering n diplomat and criteria time tablet and

-
Engineering work experience..
Engineering e visited work place training expei achievement task award degree diploma saqa ,award panel witing ..
7.2 ..content : engineering electrical career project officer outcome legislation goverment engineering go city municiy rnig theory and practical experience ..
7.1 reseat requirements job study ..
- research content ..
- research impletation time table goverment institut visited visited labour uif visted energy department city power council trade eny education department..
- questions city power years career originator career join venture education worship lab Engineering theirical pratical city power and :

-7.2. research engineering roles and responsibilities research team idea reality interest and development create new technology ..duties of area search engineering varies depending type of posity hejd general : global compagnie location salary job controle..
- 7..3.duties are to research project requirements design and development established maximal advance Engineering oversee staff operationel advanced engineering oversee staff operationel : research design product advanced field scope of knowledge ..
7.4 .electrical engineering do design and buildings electrical equipment advanced technology outcomes includes electrically skill improving

products : ..
Creatt electrical eimeet exoeryover years manage circuit workplat critical leadership innovai ..
7.5 .. assessement guidelines orientation eny vocationy conductor learn Eni learn except employment..
7.6 requirements assessessment police and and orientation learner guidelines vocational ..training engineering electrical police traffic low asssessment engineering : ..
7.7 : requirements power meter technical metering calibration laboratory sans class 0,2 single phase certifie IEC / IEC 17025 sans lab capacity to calibrate large volume electricity meter and provide a valuable meter certificate Eskom municipality meter : aware ..
7.8 testing desktop application police station information management system ,society control law management criminsj record information manuej development improve a deskt application keeping for the police start is security ..and function. Customer type power building ,processor ran operating ..7.9 research integrity framework college project compai and university high school topics policy orientation assess methods research ..
- outcom teacher lecture career skill checking engine electrical and technical trade
Grade level electrical and topics electricity ..
- tendered value course Education trade council bodies insurance bulettin..

8
.compare visited implantation career city power unity trade design analizing investigation city power plant and system undergoing ..
Strong city network is designed policy makes praticy operating municipality ..completed chargev
 Education and Education for innoi the power of digital technologies
 skikkk ..measure innovation bskikk ICT digital integration b..market

Technical indicators description ..
Koi and : percentage number dwelling with connection main electricity supplies by the number new residents bconnection .- short definition : explanathjb indicator level measure ..
- purpose and impoyancd :
- source collected day .
- method of calcult .
- data limitation .
- calculating..
- reporting cycle ..
- new indicator b..
- desire performance :

- 8.1 labour Education for Engineering plant labour mining exMinRiin

student examination safety to prevent hazard ..
-mining ..
8.1.2 feedback guzsd contrik metering schedule tarrif information preoaide energy type logging s
-8.1.3 metering error connect prepaid over load no load appliance consumer
- 8.1.4 : generation resource network transmisst system time table engineering science physic engineering chemical apply career ..
- 8.1.5..engineeding electric soecifit of machinery equipment generation battery need verificayv...period cycle

-8.1.6 compare training assessessment and assignmy Engineering e to implementating time table workplace workshop in trade city design training ..

Lesson
Requiremy training class compagny training : his managemenybcontrik during teach how to orgsnisayvteacher ..functyb..
- required heater meter energy breaking componeyb..
- operai : requirements labour training body assesstbdriven machinery regutkayb..thermo effect. Appliance to city power..

...

-nfs..
 Summary..
Rurales sector discovery..
Work of work college. ..

2.1.22..Project title : the implentation framework circuit knowledge circulum policy engineering planing product improvement contractual agreement with register trainer and consultant engineer Eley and computer science engineering..
1. Abstract : the implentation Framework circulum knowledge circulum policy engineering planing improvement contractual agreement with register trainer
expo discovery studies case Eskom ..
,static material drawing need discovery Channel patterned ways to get with quality plan being there for system need system generated undergoing next

year's analyse zero loadsshey or rental system information recommandev of anticiy danger socisj media teach ..
- the innovation define city power municiy goverment instituts city jhb delivery matter supply public private energy ..
- and define Eskom entrepreneurs commissioner delivery society goverment industrial delivery public private energy electric commissy ..
- the school and college instituts private public define by educai department teaching learner science e appretice and training and asst of learner intellectuel..
- need or problems defint the research implet problem need to resolve discovery rural and actually technolt innovation industrial sheet from school asssessment porofoy college outcome asssessment information formative and Summative to sorkply workshop mentoring component system ..
- ask factor career outcome transition learner phase exhib teachings intermedy senior college cadet minim gtadyat size development outcom industrial problem industrial maintenance b support actual machine demande factor humain size outcome tendered bid and material resources capacity product integy to resolve time framework..
-2. Purpose : ask factor job career outcome transition phase exhibit phase teaching industrial problem industrial support manufacture support technical humain material support to resolve demand factor in humans size outcome tendered bid and material resource research ..

- project importance framework allocatt time table research humain energic time table .impley adaption team synchronisation , asynchronous system regulation to resolved movement frequence response of team ..step project in the structure ..synchry ..

3
Method : material and equipments : methodolt specific guidelines asst formative Summative rebric tools assessessment ..learner time table ..allocation. : file school workers files employememy database file training job human material stationery information manuej and automatically system machine latoo computer system office database employment..
Engineering electrical ...
4. Result nNotechnoloy and mining ,wath nanotechnology wath are the danger his is Nano technoly..being used to make safe active ,2,3:
- nanktechi and energy where : dies energy Frome non renewal and energy source how can nanktechy help to build better solar panel activity the are used bank technologie b small object ..
- apparatus investigay writtt investigation question a hypothesis procedure connect your equipment so that you have show diagrat beggit by includy as completed the circuit observe brightness of ligth bulb nos observe the brigthnesy circuit once observe brigth of shores length pencil lead record ..
- analyse data assumed the brightness current and resistance do you notice

from observation ..
- write a clear conclut ..
- activity in group ,5,6 learner design and draw a poster showing how nanotechnology is being used to used to build gas sensor for mines ..
- make posted as clear Nd colours ,you teach creative ,2 marks posted show original idea ,2 marks posted is clearly presented ,2 marks infirmary poster information ..
*5 conclut : engineering discovery computer trait development and support services to existing or responsible ,club safe creative soecevto learn soacev agedd prepare learners full particip t ,in 4IR and provide exposure to coding diving sebt development graphic design ,3 design ,2 D and 3 D modelliy animation video produy ccnz Linus python essential skill existing or propesfivd ..customer accreditation customer ,office special delivery funding depending learner full standard ..
- university
y undergy how do you consitsncd student about their reality Google . Complementary roles Engineering design innovation Briles in persoecty .

- career psychoi service focus counseling theraphy education careesr resource CV job interview.

_____''_____
..research plan
1.1 scientific investigation project / experiemental b..yes
1.2engineering types project and computer project : for these types projects .
- a design process is follow according to criteria to build and test redesign rest pfotype ,product , solutions device or computer code .. yes

- mathematics theoretical project : mathematy explore quanty structure space and change starting with an observation problem or quesy mJe conjecture , hypothesis prove your claim using new or existing methods make valid deducty and idea theoretical reason yes..

Provision project topic : implentation workplace and school Engineering circular assessment police educai technologie teach and technot electrical subject school qualicafition levej in entrepreneurship and industry society and college scholarship orientation guide Manuel policy provision b..
2.3: introduction ;
Literature reviy : define concepts definiib:
Warg are benefits significant of doing research who will benefit .
- problem statement wath problems issue will you be addressing ..
- research question .
..
- hypothesis :,variable ..list indepey and the controller fixed variables..
- method ,procedure record the data ..data analysis how you analyse data ..

- ethic .safety time table.

...

-**2.1.22..**
project management experience mantor ,view school attending ,project submission, customer , applicant award certiy grade expose youth ,projedata science networks earth science atmoct creating school project ,sociaj developm ,science agriculture chemistry biomedical chemistry ,computer data management climate science energy production engineer biomedical engineering math algebraic plant astronomy science matter science matter optic .
- types of projects science investigation reseat question a hypothesis observations and .involve engineering computer design process according criteria build test redesign rest ..
- mathematic hypothesis..

2. Teacher mentor : teaching engineering and Education technologie news care Cree city and commission ..
- teach engineering youth reflection daily Cree mentor .
- lesson plan :
Nano techt and water whath is nanotechnology how small AR CA nanotechnology make safe drink activity ,1,23 extension activiy ..
- nano technology and mining wath is natechnology wath are the danger of mining teach up date lecons yes compare resolution certificate yes occupatt yes qualicafition compare system question outcome system ask resolve yes meet yes training ask component Framework yes activity yes restore maintance award ..
- ethic completed safety : circulum policy framework regulatory quality council trade council engineering circulum policy Education regulation irregularite fault default insurance quality .health injure framework synchu Asynchy learner network transmission generation distriby system asynchi real time image time frame work safety stability learner induction learner college .effect workplace industrial municit break ..material body system ..industrial .register ..
**2 literature review :
Time frame: project work plan. Plan orientation industrial and supervist orientation industrial schedule project shift days night management system information..
* 3 abstract : the implentation framewt circuit knowledge circulum policy engineering planning product improvey contractual agreement with register

training and consultant engineer electrical and computer engineering for system need system generated undergoing next year's analyse to zero loadshedding or rental system information recommand theory pratice anticipated danger socisj media
- electrical commissioner the school and school institut private public define by education department learner science engineering apprentice training and asst of learner ..
-need problem the research implenty problem resolved discovery rural and actuaj ly y technot innovation industrial industry to integrate system to standard system support natural design analyse combine sheet from school assist Portofilio college career outcom assessessment information formative summay mentoring component system to be improved or functioning to municipality ..and entrepreneurship industrial to promote graduation in workply .
- ask factor career outcome transision phase learner phase beggi. Developm outcome industrial problem industry supported manufacture support technician science system machine computer system news technoy robot science tended bid material resource capacity ..integrate go resolved team framework operai..
- projet importance time frame engi and science implttimw load industrial loss gain resource humain energic time table adaptor team synchronisation asynchrone system regulation time periodic alternative direction energy production synchy contrik wizard register access card system movemt personal in out robkt system entrepreneurs synchy system speed level up date need to control by humUmain robot system technologie
- Aim robot the review in the review system career learner induction or error implentation framework regulation mandatory learner humain resource in time framework must adjustay system resolve registered system administration standard synchronjy and stability adaptor system delay register model rain city wiring commission adapted illegajy institut or college need training and adapted in system upgrade register circular policy engineering ply ..
Design faculty learner ent entry model years learner up grade years 2023 to 2918 college class new institu new outcome tendered class grade @ grade ,12 levej university..
- methods and equipment : methodology soecif guidelit assessment formative tools asst learner teacher .time table ..allocat file students file school workers database file job emploie .book journal ..
- procedur:e description
Learner teacher educay design technology support science support team step task kperati activi career related .
- operai prelimt task method motivate automa to ion register input pour student wirkclass calling class career yes stamdnt class yes implet lfint yes workplace Eskom or city power available learner place class syncy or inspection department synchrinisay or inspection Education or labour gov adapted system account yes restore files yes relay yes compare she , loop

yes ,yes flip..equity and system post .

_____&

2.1.23..Lesson teach note

Wath is Nano techt NM one billion the length matter to pit perspective diameter average bacty ,2500nm long material 100 NM material Nano material involved the product maniput nankscat material product nano consits didco .

- activii field nanotechnology o years research .
- the electronics industry distinct need between electrical appliances electrical apply and flow of charge particle in this metak conductor copper found home appliance non metal conductor electron conductor semie conductor ..CPU ..molecul size emege sizec
- synchounkuy time periods phase move transittion job vibratoire robotic mass spring force oscillator functiy ..

MX"+cx"+kx= f(t) non zero mass friction k the spring F(t) foudies series periodic ,f(f,,) = .for cos wt ..resonnant control nature frequy control circuit ,frequency constant static displacement electromechanical system..

- synchronous ribkt dynamiy kinematy and control nomenclature operator kinematics introduction positions represented coordony cylini coordinator linear velocity representative velocity rotation matrics activity passive rotation elementary rotation rotation Euler angles unit time derivatives of rotation forward kinematy for plan fobkt are efforts post functt rotatt matrix C % Getulang xyz from option matrics ,extract ,,x,y,z anhler from % rotatt matrices % author .

X y = a tan 2 .c(2,3)((3,3));
Y= atan 2(c(1,3),start((1,1)^2+(1,2),C(1,1)
Ph= [X,y,z] lifting job ..

- synchronous: low of conservation of energy mechanical energy (kS+PS) consert ,energie ..KEi+PEi+wnc+OE=kEf+Pef+of

Kindmai eny is key work conservy PE done by conservay force energy are include problem step determine the system step potential energy conservation Kei+ Oei= kef + PEF step step Energy various object phenomen efficiency .

EFF= usefur energy or work out / total energy input total change in energy of system .

Δu= Δq(v2-v1) ..Δu= I×Δt.v (I= Δa/Δt).. total kinetic of systet energie of systet conservay u = kinetic ..kinetic t= i.Δ.t×u ..total energy stabilt work done = energy means do/ St ,,f=do/St ,St / St ,,l.di / St + et = E° cos w.t de.dt = o demonstrate penduly force ,,u = m.gg ..de/ St forcing meter grade programme supply them control consumer meter consulting tarrif renewable interface prepay .remote infirmary meter ..advance measure approach

metode complex energy system monitor and Contry kp based integrate entbcomputrf ..
- 3 phase synchronous machine machine and electromechy energy conversion device operate speed of rotation magnetic field synchdonkuy machinf base energy ,synchronjsay ..NS = 120 f / P number machine ..
Key further synchrously machinf two input supplye generation system volte cogeneration v= En+Is(Ra+jxz) v voltage armature input motor is giving ..pin = v.ia.cos
.,O= √3.v.i.l. cos ,,,B= ns-nr/ ..ns×nr .369 ..

-inplementatiin and stability inspect cycle training job function psychomotor ,metric job analyse survey rate functionalite rate requirements of job class analyse process result premirt result job session category data work instruction analyse PC to collect data constructy job tools build ,,machine function rules predict create teacher spreadsheet ,,ansynchryncard machine ..
Asychrt system effect phase ,3 space 90 ,129 wave ..understand the gradient function slop slip tagent ponts derivative functt probably calcul gradient loss functionalite scKar functionalite have two function partial dery .

- maintenance during operat abnormales yes schedules order maintenance database yes ,yes periods impleny leader probleb counter measure equipment inspection insoectt factor dry baterry process phenomenon bateerie filling revolving tables description load balance ..
* Project
* Social investigation : science natural : support social creation orientation circuit assessessment police enyrepret sector product resource Energi electrical commissit training system circulation system sociaj machinery safety OSHA health in the time framework regulation circulum sector education grade and levej job system sub sectoriaj system social workers synchrously
 *Teacher mentor social mentor education sociaj labour land reform system organisat entrepret and humait resource system Education system asynchrout sociaj class society science media work classes famille class work project orgsnisay non governmental sociaj educai entrept sub sector self emply self was illegaj .system in normally enterprise system ..need educate sociaj .reason system not qualicafition required..
- lesson file worker ,size years skill devy size ,class model frequence ,means compared size skill semie grade qualicafition years criteria ..
Master society rural work position

Master system by ongd support
* Teacher Mathematics: investigay : framework regulation circuit policy for mathematics resolve ,equation computer
Algebraic logic analyser logic ,system mathematics find problem proof existancs .

: synchrously system to find more equation algebraic complex number master system derivarjin equation mathematical ditribut and transmisst power was real system equation mensuray system equation and compare slio of number derivation ,angle time periodic loss time that was equation triginot geometric pattern ,static and probability ..find projection number real and Cass reason linears system ..
Teaching education system mathematics education subject ..skill compilation robkt system capacity of synchinoust system mastering skikk number use instrui take measuy rule and measure instrument for understandt ..
Lesson plan orthopedics.synchrinousd ,system ,system resolve plan diagram current sinusoidaj wave from angulare projection ..
* Science natural chemical physic : project earth moon sun planet system qhantun years days ergonomic naturan ergonomic grade classes grade geotechnical eny investigate class matter atonatomic cycle watter cycle recyclage matter investigation fund matter chemicat composit matter solid gaz liquid stats ,molecule iron electronics development skikk material charge discharge movement find current ekectricJ mining degradat material graduatt material system , synchrone maferian cycle , chemical size diffiu to synchronise reason material synthesis stereo binary mole synchronise x rayon cathodic system. Spot ..reac valence ..
-physic stars ..electrostatic electrodynamic electdomagety wave investigation force electrostatic transited phase km/ s ..
Teach education : investigay psychosocisj developm system naturan task computer files education technolt science didactic syseb ..geographic recycle industrial ecologie environment system biogense system health protection
- teacher mentor safety security accreditay teach traffic police ...

- p

* Definition : ethical ..
- introduction .
...

-**2.1.24.. project:**

Work of work base framework college ..

- appeal application qualifications n diploma award and master buchellor diploma award dr Congo leaver 2016 submmissy and transcript certificate record supplementaire TSA completed n

diploma nationsl level 1,to 8 quality insurance body iirregularity in progress marking recertifit re acredddditatiin insurance body iirregularity transcript material ..NN diploma backlg project theory electrical pratical framework scope..
*Quality council trade occupation qcto Engineering n studies skill programme evaluation checklist template in line with policy qualicafition ..
- record of feedback evaluation and moderation process and evaluation moderator assignment ..
- qcto : evaluation date ,model ,moderation ..
-:section is completed ..yes
Currents template .
- documents
-**2.1.24...1.2.3 qualificat part qualicafition skill detail documents policy in each ..**
- skills sub framework ..
-1.2.3 purpose : the document satifie policy requirements ..
- soft skill include the document.
- curriculum structure .
- entry requirements satifice requirements. Document standard yes .
- qualicafition patterned for assessment is indicate in ..
- task linked to task ..
- knowledge module .
- work and integrated..
- qualicafition development base ..
- skill program document for follow skill programmer ..
* Qualifications title design equivalent. Credit day 15;graduate criteria .
* I'd | | credit | total Min .
Engineering. Level 4÷ credit 120 = 30 Lev/ credit ,,
Level 2/360= 180 national diploma..
National n studies purpose ..transcrib ..
.* University communication skill computer..*

* 4.1 enquire qcto certificate acreditb :;.
* 5.11: requirements qualicafition trade award certificate ,1th,2 th , 3,the ,4th.

* 5.1.3:purpose orientation industrial organisation planing supervision management supervision management system information data portal portal student data portal
* 6.2.purposr criteria entry trade : theoretical and practical examination n diploma subject occupation council trade and qualicafition trade engineering students field ..
- subject trade .
7.3 purpose pratical trade national frameworks qualicafition relate theoretivak Framework base vocational ..digitsj ..tools instrument ,series ..identification .....

8. Theoretical framework base experimental experience outcome engineering electrical fundamental basic electrical trade construction : ..
8.5 purpose entry criteria minimum trade qualicafition occupation test trade industrial orientation ...
9. Purpose learner examineration completed applies skill electrical trade theory :
- 9.1. purpose : explanation low speed control motor mean outcome normal speed above normal speed increase back EMF fall resistor has been cut and the motor normal ..
- explanation low ..shunt shunt motor can be mode to run at three speed field coils. Series connected .. ..
9.19 purpose , explanation module programmable logic controller explanation wath a pick function a programme logic controller components use languages for ..

- 10.purpose engineering pratice 24 NQF ,6,5,4 month code trade component ... engineering design linear circuit DC power supply function work low standard size trade advanced system trade association ammandement..trade basic x .ex (exl x+ e e ÷ X) = work exponential logic ,X work operate factor emped logarithmic activity x inconud divide work expoi x work static analyse visa technique techni rating minimum maximum variation ,X = v ,, X = dy÷ dx = d2y ÷ D2. Low
- X work operation ,X en product X logarityv factor linear integration. Testing pannek linear ,, lb Vab = Va - VB = R 2÷R1+R2+VT , Dy = dx = X.exp.ex (ex.ln X + ex÷ X) exo ..dy÷ dz = z = (R (x.z.z).e÷ R.e(RC+Z2÷ RC+Z2)+(tc+z2÷rc+z2.ln RC 2+Z2)*(exo e÷ RC ÷ RC z2÷ TC + Z2).exo.Rckz 2= RC+Z2=

-6.7 Explanation mathematic limited rules : differential rules seconds derive ..rules integral ..
- 6.8 . Purpose qualicafition lab workshop pratical eny electrical power system : electrical workshop tools precause work pratical in disipliy design equipment ..task is concerned to design domestic explanaty ....
6.9. university work base university workplace funamentt lecture process control research ..geatechnicaj subject Engineering science building Engineering electrical electrical geotechnical mining new approach stability analyse embardmebr present result ..base ...

6.7.7 LMS framework regulation explanation information management company explanation Eskom mandate from holder assistance businesses Africa provide stability of electricity supply through provide provide provide in efficient efficiente sustainability.mNy will an electricity network generation transmission and distribution whiks ..

- base load station ..coal fire station me ,nuclear power ms ,

...

***2.1.24.. project**
framework qualicafcation implementation:
Award diploma certificate markshet ttanscript. Letter expert theoretical pratical research Engineering n studies outcome .. experiemental, completion letter pratice experiemental log book .
..
**Resulted. Award outcomes.
: NN diploma,, combination letter,and Sita umalusie. Back log insurance. Project complain printers , release result application ..aware learner. Record learner. Academic ucpd ..

pratice ..dhet research assessessment irregularite nated info workbase ..
1.1 section one : assist in capture profiling job application career portal log activities ..
1.2 design of reporting templates table excell ups engineering electrical b...
1.2.3 library and information service sciebonk career and college peace info classes ..
- technical dicumentay in simple step : businey files data during operat documents size store career control .. access keep and analysis career outline sni step ....
2.2 purpose career explanation course customers training manufacty execution Scheineder electric PLC introduction to PLC level @ ecoxtrucfure exper programming level ...power monitoring b..scheinerd electric case ref 107583457
Training inquired community badge topics.

Bill of material configuray - is modicon PLC configure

BOM level | position | ref| descrip|™qyaty

Motion controller ,regulated switch power supply.
Processor modic , modic technology variable speed segment and process machine process

Motor circuit breaker ,contactor completed training. Power digital transformer cooling technical expert assessessment,guide book , utility bill verificatt , fundamental in technical doc review , biometric inyegrst switch lonwork introduction ,alarm management performy,equipment ,build scrip program low voltage ,physicK manage basic ,electrical approved it ,wiring

exoet

Be aware customer increase appreciate. Support. ..close
-2.3. section eny 4 job design explanation SPUb duty

-Design calculation for electrical design spu design and guideline. .. university

4.6 basic requirements for electrical calculation , non computer calculation must be on standay calculation sheet with the completed filled ..
Section
Section 6 ..
- 4.7.explain proposed gate RK .. architecture ,gate. Systeb mask ,matrix buffet. Network methodology

- explain part start ted in electronics from electronics to electronics kseo component shack sticking ..pletora filing project..
- section 12 career education graduate didactic evaluation assignment hyscologi teach career orientation management education ,systeb skill education training personal facility
- topics innovation research career path assessor entry student in outcome base career continue devey professional company TVET instituts in assessor moderator experience company..
Ass task memo time type scope..
- explanation criteria didactic framework quality academic transcry certificate certificate assesment meeting ..advanced bachelor design ICT .. install PC

Section azure Microsoft project GitHub
Dtic ..

- manufacture process.

...

- **2.1.25..NSF project ..**
-1. workbook is compilation of adapted formal assessment brief career - project exhibition .
-1.1absrracr scie bono career center library career mentoring discovery assessment Engineering studies field and ..

1.2. purpose explanation career center expo science journey of self discovery.
- workbook is a compilation of adapted formal assessment brief career project exhibition..
- name : tshingombe Tshitadi
- date :
- section A: subjects and studies ..
-section B : skill and ability strengths
- section C : preferred field of study s
_section D : preferred field of study section personality ..
1.2.1 subject entry : A career electrical Technical , mathematics infirmaticB,motoring C ,saqa award degree level D ,, Engineering electrical E,, panel wiring F ,, skill inventory g , functionality transfer skill and outcomes..
- engineering technology scie studies ,,des and training art audio visual technologies communication architecture area construction.
_ 10to 110. .print"a", b,c,d,e,f,g,h,I,j,k,l,m,
-120 input   "a1", b1,C1,D1,e1,f1,g1,h1,I1,k,l
-230. Output ("a1","+b1"+"c1")
-240 output ("d1+"e1"+"F1")
-250 output ("g1+H1+"I")
260 .output ,(j)
290..if ;{"d1"+"e1"+"F1")
300.elae"t" subjt ,next step ..
- 310.{" g1+H1"+"I"}
- 320 else ..
..-330 if and subject step = 1 ..
- 340.show outcome display .
- 350.next string will..
Sub xcl ,xcl macro,,end sub

- project technilogie outcome project career design circuit principle career explain diagram ,,
Design logigrame, algorigram,design table ,,
Design technologie career psychometric Education variable ,education sequence series port impulsion contact mother feed ..CVS switch term work value way cluster selected box peer ..
- logic process: A=01111111111,
B=001111111111,C=0001111111,D=0000111111111,E=000001111111,H=0000011111,I=00000000111,j=00000000011,K=000000000001,
L1= 1, L2=1,L3=1,L=1,,
Educ technologie career psychometric AK ,,education logic process code module ..
- mode phase switch variance term :
XA= 01111111111,XB=00111111111
XC=0001111111=,,sum = XA+XB+XC

, xD=0000111111,,xH = 00000001111
XI= 000000000111,sum = XD+ xe+ xf
,,,xg = 0000000111,,,xh= 0000001111,,x1= 0000000001111 ,,sum = X d + xh + xi ,,,xj = 00000000111,, X j= 000000000001 ,,product switch ..
- Reder subject outcome ,module week term allocation phase transition outcome level career , elementary, intermediary senior ,,
- conductor semie conductor switchbkey career learning logic binaries code module subject ..average guidances ..
- module career (sum a+b+c) ,(sum "d"+ e"+" f") (sum" "g "+ "h "+ "I ").

-1.2.4 task career step operate logic input output learning sum ..module phase phase foundamentsls elementary intermediate senior modulation scaling block career input output phase ,phase a, phase b ,phase c ,phase d ,phase E ,phase f ,phase g ,phase h, phase I ,,activities key learner ..
- module : ligth resistor induction learner bulb .
- module rectifier redresseur phase angle diode operator phase sum career ,5 v logic 1,0 or logic 0 volt ,diode code encode display resistor ..
- module : phase career amplification gain ..good average ..
- module : phase career amplification career gain module transistor ,good ..
- module disc triac thyristor integrator circuit : display subject % ..
- line linearise , control logic analysis assessvisment .lineare sum job equivalent bdivide job analyse function job task switch task modulation course
- electrical drawing project ,methods ,measure instrumentat ,electrical ,industricuty mechanical ,lab language ,electricak grade , logic mathematic informatics ms dis work ,outcome certificate ,Pre math physic draw technology mechanics electric telecommunication pedagogie technical prep math physic drawing technoly mechanic ,logic rwiten expression oral ,pedagogie intro psych ,,machine.vs

Equivalent subject 12÷4=3...24÷12 irregularity translate subject Completed subject n diploma national trade and orientation industrial ,supervisor management, .. supplemtaire

____
Science computer mathematic equivalent undergraduate and master graduation

____
Professional career equivalents job training outcome

 electrical equivalent under graduate education technologie Technical Graduate career Alison Microsoft , Scheineder Eaton university career

Sarb ,.

 entry criteria job selected key ,phase subject electrical start goaj ..outcom

job 39 days modulation 90 days allocation

E ,,research operationel career implementating career join venture course minim ,, horizontal map ax = 10000000000,Ay= 1000000000,Az = 100000,ax,at,az,,resolved variance covariance equation linear ,,ax+by+c = ,,lecture reading about ..research map ,xa,ya,az operationel career work transited job duty functy line project key transfer research intelligence artificial genie civil technical.

-*1.3. referral library case book photocopy project ,,link sciebonk and public library open bare shop library computer ict
- job discovery library book job inventory job career career ..
- learner discover career : job topic case book compagyb..
- facility discovery career job topic case book compagny agreement ..

- learner name :
- facilitator :
- name :
- moderator name : assessor name
Hr resource framework close compagny..
- libraries ,,sciebonk career center library : tools assessment library and material assesment project library career center :
Entry criteria / task booking magazines..

_____
-id order booking | topic booking| |cost booking ||| topic project cost compagy design design review ..
- web site
- news papper .
- magazine guidelines.

- outcome : exhibity project compagny ,entry criteria task book magazine :

- inventory framework education lesson plant Portofilio teach engineering : 4× 6 subject = 120 volume record textbook , Engineering nated n2,n6 vs 10 copy exam papper theory subject ...

- title,,asbn,,authority, submii,,order booking account ,,
- exhibit job booking compagny trade business job ,exhibit post job ,,job Engineering studies,science engineering entry post exhibition ,,job career
- science engineering job discovery natural analyse investigate device job : job requirements,job abstrak ,job purpose ,job submisst,job knowlody,score mission ,vision ,, reward , earned,badger,record script certificate ,,cost project ...
- A: career electrical Technical ,coat projec,B : mathematic informatics,yes

saqa award yes enyekectrucal panel ,inventory ..
- design table career technology.

a,b,c,d,e,f,g,h,u,I,k| l1,l2,l3,l4,,

Design education electrotechnology technology module ,,binary

...

-**2.1.25,, 2. Project :**
- project skill Engineering an master skill engineering.
- facilitator: tshingombe tshitadi
- discovery career sciebono
2.1 Scope: career center learner studies , library scie bono and compagny scgoot day instituts :
Fund exposition v,science discovery Engineering learner assesst trademarks training facilities engineering product course subject relate process learner choice outcome ..
2.2.purpose career : career center studies : and compagny school submisst discovery day ,eny studies career prospects ..
3.requirement career : center learner studies and compagny school tools asy engineering day .
Mission ,vision : learner career center discovery day school ..help
- 4. Operation work : information system management key attandat day record sheer scheduled..
- 5 intake :
- name of facilitator: tshingy tshitadi fiston.
- client name .
Name of institut ..
- field study : ent electrical ,general male ..6. career design item list check :
- 6.1:subject choice ,career choice and guidance ..
- study skill..
- time management skill ..
-job search skill writing interview cover letter
- self directed career exploration career resource info ..
- learner employment skill trainer career resource ..
- learner employment skill don't career workshop :
* Subject choice career choice and guidelines ent studies electricak ,studies skill eny electrical and education technology information office ICT technical support teacher assessessment police ,time management skill : information management system learning self journal discovery ..
self directed career explot career ,self assessment task learner library written search bubliotecha case book ,,
Career work school library lab technician documents , task job assembly job book prospey learner guidance lesson plan Review

- facilitator note issue with reason discovery completing supplemtaire subject and self guided by career center covered learner ,expectat service ..
- learner discovery career job topics book compagny..
- facilitator discovery career job topics
*8 framework assessment. Learning and pratical learner theoretical school of discovery journey research : career devt . Mandaty learner goverment system LMS sector training authority accreditation learner LMS information system data base research discovery , science engineering clause and supply trade manufacture relate low learning lesson course grass ,, career mentor psycho social learning lm ,,name ,,assessor resource framework libraries career center ,enter criteria ,topics discovery enventor science technical technology ent,sub topics ,expo scie fund ,,topics assessment invention claims process invention process research ..
-literature price lesson plan
- unity design ,check yes not meet ..
- fund Book formulation method ret approach ..
- implementating framewot methods criteria.
- career psychometric plan plant ..
- clause close tendered career minimum maintenance agreement system ..order case book ..order Cass book review job learners system management ..
- order booking digital marketing web ,library digital manyek order product day work bookkeeping written research career bibliographic autobiliographic b,,
- order web research internet career ,career St peace in skill bono review,city power,Eskom web site career information ,textbook research order book going vilun ,lesson plan education teaching learning circular book papper research libraries career archive,,
- order booking engiu compagny eating web ,sabs EIC isi ,order book Scheiner cashier training library ,case case training research on line order booking ,cahier to bulletin..
- Microsoft web site ,career training ,,Google site cloud wallet document ,data rigth met police web site ,tableaux trenddr Salesforce blazer training ,web sicim ,web site1000 PG cook book downloat incidence suppli dtic CDs learner close ,,St peace college topic. Order 1000$: propectuse merseta guideline ,dummies self discovery , Scotland papoer exam UK review research tshingombe Tshitadi GitHub. Profile ,Io met book license ,,Ccma labour court/ CCMa review granted referral library a bargaining order director award ..jr 2461/15 Na 37/19, gaek 680. Private council security bargaining ,union police sapu, ncbps. ,,notice motion web site DOJ on line. Order case book issue Manuel ,,saps station docket decreive docket,, sarb sars ..
__&&'&
Record booking sale job career

- internet archive aware ,award GitHub ,,system book. Booking review

order

- aware dhet ,aware saqa booking system cellphone script..
- aware scheneider eating ,sciebono filing aware career. Process job file appreciate career and regret career ,uif could compensation .
- met career successful record..career outcome ..marks outreach ..
Met.sars sarb Portofilio psychometric ....
External internal invoice aware .record regret succeed in profile..
- council engineering,council trade aware I'd book review on line system
- Microsoft ,certificate journey aware .
- dhet Sita aware complain review ..NN diploma,,aware saqa on awarded no meeting requirements .
Atlantic university prospectus ,,
Certificate ,,master class doctoral ,,
Twt propectuse

* He'll day visited library career work school ...
- lab career center lab w Education workshop school work in Education school department research topics high school project career .
- enter work workshop electrical chemical didactic lab , lab value completed center give physic microscope completed optical electric education technology education process fabric project lab ..
- research depay instiy science is career center fabric project , career education expo ,discovery lab career career center job service education ,material didactic career center psychopedagogie psychometric lab variance radiographic ,oceanographic ,oscilloscy test career opthmolofg electric medical chemical , elevator physic longitudinal ..reactor reduct robot grad lab material ,
-material diacfict physic chemical engineering science matter didactic theoretical experimental help center materiaj didactic experiemental help center material psychometric module ,kinematic move ,
- hello material module completed lab oscillost test inspection work lab science oxymetr ,hydrometer water electromechanical,hydrometer .water ,,acids psychometric..
- battery trade cell batteries help measure instrument matter psychotic council assesment module motor trade ..generation next year's
- help resonnance experiemental workshop induction coil experiemental wire premise lab test caratersic test workshop assest robot machine ICT machine ,technologie qualification panel circuit LRC GIC mechanical orientation life to pratice orientation industrial ..
- material didactic teacher art teacher exhibition presentation topics lab work psycho teacher board pedai art lesson manipulation youth engineering discovery bhelp manufacture assessessment theory pratical activity school exampt

_____
-4.1. topics : discovery inventory science technical technology engineering.
- sub topics: department
- scie bono .
- expo science .
- fund expo.
- techno science expo ..
* Name case study ,learner,name ,educator ,,
* Topic assessment summary pent invention claim relate low trade manufacture process ..
,- book invention process research papper litterature price lesson plan..

2.1.26,, 2. Gift award. Certificate appreciation job point mark :: record marksheet .

- |Ref. .. |Check ,y/n meet inv
- Nobel price discovery aware ruling rescission default aware , transcript certificate ,, issue career low award book ,reward comment lesson plan.project ..
- invention - discovery collection book knowledge book ..
- person discovery book papyrusd ,,gystoric reading ...bible ..
- invention electricity how work ,,
- discovery career ,awareness publishiy ,,book about career book introducing a different career explain wath job entails ,the skill and personal qualities b..
- career review ..
- history of books ,explain the evolutionary copyrith laws ,creativity flow and the psychology of discovery wath evolution wath first areer..
- base first activity...

_____

Form Microsoft assessment 360

* Topics discovery invention : topics
- topics discovery invention career science , engineering technical technology..
1 .summary invention claim :
Option
2. Lesson plan discovery manufacture ,discovery claim book career center scie .bono ,expo science ,college ,career kheta ,fund research ..career advice mentor. In center and in national trade vocational and institution education
-
.- question ,,
- claim inventory fund formulay like check meet criteria book .

- invention claim actual technology generari years going innext generation ..
- factor graduated recyclable manufacture meet rank subject required book .
-* claim invention order commissioner inventory section booking ..section booking. In option
- statement 1..

-statement 2
..
* How likely are you recommend us to friend , facility tshingombe like design ..

* Review topics discovery invention ..
Respondent :time to complete 00:07,,score 0%
* Summary invention claim : score : pts mark
* Lesson plan discovery manufacture discovery claim book career center scie bono expo science ,college career ..pts
-* claim inventory factor formulation like check meet criter..
5.acfual technologie generation years going in next generation .pt..

6. Factor graduated recyclay manufacture meet rank subject required career book .
- claim invention order commissioner inventory section ..

_____
*Topics discovery invention : invention
1- sub topic department education ..enter .
- name learner .
- name educator .
- name ..
- summary invention claim number pente .2. name learner :
Name educator ,
- name school address.
- summary invention claim

-2.1.27,, 2. Projec
6.Project :
- Education provincial
Scie bon ..
By tshingombe fiston learner and reading news pappers and study workshop use computer : write CVS ,self career ,
- submitted in fulffilmt of awards library career center .

- studies career mentors : libraries mentoring career :
- supervisor : assesst career :
- supervisor career :prudence, Zondi ,
- management assessor counseling ,,
: doctor ..
ICT team virtual payanza ,ICT library career center ICT security technical support library officers documentation system ICT technologie it ,,

- cinthia moholo
- margeraux .
- IanBamberg.
v
2005 ...
- teacher
Teacher : library career award degree diploma assessessment ,master buchellor diploma ,, honourable mentoring ,education technology education education tech science discovery .
- award title labour court labour ..award ruling permit submit application notice ..competitor 5 years award title rescission ruling award variation award ,order director award ,bid certificate bid service labour court skill development training and train training facilitator..

- cc outcom ,seta outcome spa psira merseta meeting team ..
- casebook career attorney form
 .discovery claim
- seta skill , doj skill. Developm , ..judiciary research policy. Goverment
* 1 forward .
Discovery record claim transcript . bargaining councils education labour and education justice career low science framework regulator management system,communication skill admnister , performance assinformation,research method policy circulum outcome lab science career pratical school science psychology facilitator

* Executive summary foundation teacher career.
-; can 1.forward
- 2.executive summary : foundation career
-3. the school system
- 4.the Framework for evaluation and assessment.
-5 . School assessment
-6. Students assessment
7. Overview , prospectus assignment school ..
8. Challenge . Reducing costs to deliver courses .
-challenge . Achieving engagement and and success .
- challenge ; selecting the rigth technology technical support ..

- technology : open source teaching platforms .

- technology : trade and education technology .
- technology : cloud based ,and Education technology .
- about judgement review assessessment value and form judgement justice review case book development resulted bargaining council and attorner learner assessing form circulum order information claim review law .
- appendix feature .source ...

* Forward : view occupaty trade counseling assessessment guidence filling firm select time table library rwiten reading learner education compensation over time prospectus discovery science technology trade trains mentor casebook achieved value learner..
* Executive summary: foundation ..
Scie bno ,
- introduction .
- career and psychological support service terapeutt.
- topics activity psycho ,education
- psychotechnical.
- psycho pedagogical foundation.
- teacher .
- didactique evaluation .
- write oral language

2.1.27, 2. Project,, 2. Projec methodology agreement

- background to study research aim
- career related services .
- career guidence
- psychopedagogie support .
- psycho education emotion assesment..
* Summary : science show entairnment away the learn more about physic workshop innovative and dynamic learning experience on range of topics farm rockery to robotic and the Doppler effect science and technology competition provide stimulation challenge to motive and inspire science we do keeps cutiose mind engage active ,, interviy old discovery career talent disruption qualicafition end case book .
- finding way grade ,ease transition from to nigh school transition ,,career and work role grade
- introduce learner to relationship bey scholatisc performance interest interest and abilities career field difference learning career a learner career field student choice learn critical skill in economics..lunch career grade ,11 × 12 prepares to life after school with information about career study option ..
- surfing workplace assist out of school youth with job search ,, life skill grouped learner life orientation .
- life orientation series development ..

* System evaluation :
* Industry site and trade show organisation tours to various industries and experience of daily work to various , seminaries exhibit ,special event platform grade take national career dress ..
- community engagement
. strategies partener education
- chapter ,school assessessment: workplace framework qualicafition national framework , opporty for school learner leavers university discovery ,,

* Teacher appraisal : labour department referral

Design..
* Grade 12 grade discovery asses career and psychological career and therau related ,service psychometric test x,y batterie droitegre variouse days , experience grade ,7 activity topics manager rocketry robotic doper effect grade ,7 transition from primary subject work grade8,career career performance development pressiin finance discovery covert front transitoore rotation master skill transistor , point occured condition .
Grade stationary ,1dx/dy.dy
Dz series ,2 work competency matter answer asaessering outcome exit record .
- total ,title build graduate 20 h ,h final variation ...

- challenge achieving engat and succus :
Programme title : assessment record level .
- challenge 3 selecting the rigth technology technical support:
Education technology manufacture integrity assesment : section introduction , practical and value the workplace test application competency ,scope isar ,topics 1 mark off eny ,topics operate and monitor miliing , ,topics operate and monitor ,isat overview b..
- sub task | activity | time framework allocation ,| mark allocation | discovery checklist sust ,,competency rating scale .
- technology traditit and Education technology :

- drawing probably permutation number take ,,variation ration two area.
- two tosses vertical unity represent probably unit of (1/2:
- Kirchoff low histogramme regosta ,, prob 3a/4 reosta grade 369 rotation .

- system devet file register skill devet order value assesment judgement b..
- system scheduled completed .log activity .
- requirement filed cost .
- form project record ,interview ,organisation filed ,revised
...

-:grade / post level : grade e,d,c,b,a level post 1,2,3,4,5,6,7,8,8 honourable behalf transcript attorney ..
- reprensentativs in the disciplinary process : union trade working bargaining council ,
- detail of outcome of hearing .
- notification of outcome assessessment: possible award grantees arbitration conciliation granted Ccma outcom legislation learner judge celef ,judge studying applicant responder learner skill development sector employment .
- reason for appeal case occured : substantive fairness the penalty was not appropriate to the charge not attandance ,simillare case of dismissal appeal notice motion petition over stay file ,,procedure fairness were not followed reason for requesting an appeal tick appropriate block of project evidence claim stay case not retrieved .. framework qualicafition ..released resulted record discovery over stay project ..
- the extension of security of tenure act of 1997 Esta related ,,amended by rural devel land reform general amendment act 4;0f 2022 ,, ammandement by land affairs general ammandement act 51 of 2001 from ,, ammandement by prevention of illegal eviction from .. and unlawfully occupation of land act of 1998 from 23 ,,Amanda trespass act 6 of 1959;amendment to extension security of tenure act no 62 of 19971 condition of apprenticeship..
- Tito Titus mboweni minister of labour acting of term of section 13 of manpower training , determine that trade automotive body repairs machinist in the motor industry in the RSA operate with effect,learner application process notice motion execution referral compliance faillure..

*"Project of low rules claim discovery

In machinery
- pleading index .
- number | description of docume | PG number
- developments sector bargains council skill ..
- notice of motion petition affidavit .
- bid close argument record retrieve file supply head argument .
- notice of motion bid ..
- application for leave to appeal rules regulation .
- judgement leave to appeal ..

-; transcriber leaver to appeal be fore the honourable justice ..
- set down ..
- lost other employee ..
- enforcement record ..
- order checklist .
- affidavit in support service .
- index of motion proof ..

-application conduct cancellaty .
- application conduct cancekkatioj ,appeal sociaj application void uif ,casebook learner work book section casebook ,Cassbook work labour head submission , total ..

...

- represented involved approval award of rescission conferred by the university the procedure do not apply to honorary award reference title -rescissiin of award..: a graduate who wishes to relinquish an award shall apply in written to student success all documents..univery attest conferal award accompany the application docy are not available b statutory declaratvstating .graduatt officer head of school research faculty admitted to an award incorrectly as result of an administration error recommandatiin of rescission of award form must be completed retrieve all documt ,issued by yniversy ,chancellor or deputy Chalker research policy replaced any time printed copies thereof uncontrolled , policy library ,, for rescissiiy of an award as result of penalty applied in breach of university rule or policy chancellor chief officer review ratify case the decission ,submission of rescission of award form to council for approval ,,council must submitted secretary academic ,effect of the resolut of council for shakk statement of reason that decission working day , attest return 10day working ,,testamur completion and ,record transcry and the Austrian high education statement , no longer imply , employment educatt professional bodies assiciyv,privacy management , amandemt of recipient record.the university delegate , advancement communication of the relating ,when it has been identified that graduate gas been admitted to award record relating to any action or decission ,record rule ,authority compliance ,the legal and governance officer is procedure ,student observe procedure operate policy ,, appointed council member visiting acadet bodies failit,,,award recognise qyalificay include diploma degree ,master or PhD ..
- a legal document imprinted with the universe academic transcript ,is the official record of a student of the academic result , recognise of priore learner prise scholarship awarded natural status of that pursued by graduate named in the statement , means the rules take effect on the days published later

...

- *2.1.28,,, 2c overview : framework in qualicafition ,
Single framework standard generation in higher educay qualifications accumulation of credit qualifications work integrated learning .the framework.
- characteristics number of level
 description , undergraduate.post graduate .
- qualicafition descriptors .
- naming of qualifications b.
-; qualicafition and academic transcripts language certificates and acadet transcript and academic transcript supplentt ..
- admission to higher education .
- progression within the framework implentation and ,
- implentation .
- programmes and qualifications .
- new programmes and qualicafition and admissiy education new products full compliance higher education management information system..

- higher education qualifications descriptors .
- higher certificate advanced certificate .
- diploma advanced diploma.
- bachelor's degree ..
- bachelor hours degree .
- post graduate diploma
-master .degree
Doctoral degree ..
Qualified least 50% of minimum total credit qualification exist levej used second qualifie
___''
- *qualicafition and academic transcripts award of. Of qualicafition are awarded to marks the achievement of defined outcom no qualification be award as compensation for student faillure at higher level or by default ,,
- issue transcript is not a qualicafition is not qualification but a document issue institu to ion to provide descriptive record of learning institutuand whether has been awarded if student is able to completed a qualicafition later register for different qualicafition issue academic record of the student concerned at that institution..
*Language of each qualicafition certificate issuevstudeg RSA system 2002 policy of issuing institution policy ..,,certificate in Latin must also in snlishb...attached supplentt must describ property b where appropriate students pursue Min education and council on high education framework possession of qualification does not guaranteed a student progress and admnision to programme study in term of higher education bact 1997 the decission to admnitba student to higher education bstudy is rigth..
- diploma certificate advanced certificate type specification ,NQF level Minimum total credit ,360 ,120 , minimum credit level ,7 : 60 maximum Toal credits at levej 5 : 129;,designator not anot applicable ..

Purpose character : progression ,: completion of a master degree meet minimum requirements v master may not be award for early exit master may earned inof two-way advanced research project culminating in products and acceptance of thesis or dissertation or successful completing a course work programme requirements a high of theoretical engagement and untelly a research project culminating in the acceptance of dissertation in latter case mininmy ,60 credit at levej 8 must be devoted to conducting and reporting .master graduate must able to deal with complex issue systematic sound judgement using data and information at their disposal communicate their clearly to sprciaj demonstrate self durectivdv autonomously in planning and implementation tasks at a professional or equivalent level continue advance..
Bachelor honourable degree level 8 ..

-
...

-2.1.28. project:
Outcome
Processing
Informatio
n , orientation
- assessment: curriculum outcome results . Experimental work of work and work course

- file running job employment : vocational guidance career .
- content file display book 10 pockets :
- I'd flips : 0016910025
- projects photography , drawing curriculum vital ,art
work ,documents,design,account homework financiy legal present ,wallet documents casebook ,
- content p.g data academic ,
-section examination I'd resulted statement letter appeal .
-section examination letter LMS experimt info add back log item workplace issue CVS ..
- management information system education and learner .
- management's system info policy security recruitment data source .
- vocational guidelines total theoretical base framework tot grand faculty entry exhibition
-;Orientation class pratice files store room CVS learner ..
- psychometric : learner facilitator career job CVS writer mentorship

cognitivity analyse synthesise evaluation .
- technique documents archive file library casebook .review book program page order book ,price info work job ,
- choice career guidance job hr
- personal training ,issue license certificate ..
*Record learner years fiscality award certificate license issue job on certificate award diploma .school national trade..
- CSD treasure supplies ID R016921869
- dtic : invoice career
- R&D tax incentives : reg : 2013/0344980 .
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& Facebook city power profile tshingombe badge

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Designation files |. check
- total faculty career guidance rwiten career outcom .
-total experience : content 10 pocket 200pg..
-pocket section 1- file examination 25 pages ..pocket section 1 file examination 25 PG - 1-25 PG ..
-statement national N1,n2,n3,n4,N5,n6
-allegatiin iirregularity letter.
-in studies
-statement sworn affidavit
- incidence report resolve complain ..
- record academic transcript 21000202023812.
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Engineering record challenge certificate security
complain ,24031100600003192 Microsoft ..
- saqa purpose accreditation non creditable saqa record outcom explanation return fund letter .
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- outcome complain intelliy service inspector general intelligence complain investigate CVS Poe's college from database .
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- label outcome skill development nated subject skill pratical from work engineering pratical theory NQF qualicafition trade skill pratical ,7 Occupation pocket 7 city project ,,printed word process relay issue along license .
- CVS experience biblio a library compagny energy power electronics power project discovery design job simulation theory machine instrument research job file assembly job book AC ,DC machine instruments energy power transmission general cogeneration

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- years achieved scored career faculty Engineering electrical studies guidance test interview rwiten ..
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- pratical material tools form papper filling resulted topics evidence rules week 3 month praticak cancelled additional registration suspension learner explanation career outcome control inspector didactic pratical success praticajb.
- school inventory project exposition bquakity test control error assign mean value psychometric career pratical ..

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Project
schedule

Scheneider
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- **2.1.29..project**
Community : forum ,knowledge ,events ,
Cadet online compagny
- Schneider electric case #10758353 , scheneider electric case 107331068 ..
Subject : training inquired, Za return

* Completed training course

Title | type | completed date ,score , status
- scheneider electric vision edge : powering digital transformation : video completed. Record

- secure power virtual certification on demand 2021 session : 1/242024 ,co mpleted

-cooling virtual certificay on demande ,video 1/24/202024

- technical expert assessment video ,/ external content

- Dir GL 36R000 technical expert assessment
-technicL expert assessment workflow ,external content

- technical expert assessment guidebook .
- Scheineder electric information technology guide ..
-schneider. electric information technology guide ..material

-;heating ventilation and airborne disease transmission in A health care setting.| Online class
- ecoxtruxure power : energy modeling and verificayv ,ssie
- verification Dela facture / ecoxtruxure power : utility bill verification
- discover telemecaniaue sensors .
- ecosyruxure power operation Ch 7 add mechanical chrapgic and control ..
- ASCO fundamental in technical documy.
- introduction to docket ..
- ecosyruxure security expert : biometrics Rader integrai ,4,$
-discover harmony xB55 biometric switches .
- ecosyruxure building ,lonworks introduction part3.
- innovation talk : why alarm management is the tip of iceberg and the best indicator of a poorly performiy control system ..
- ecostruxure build script programming self ,study ..
-;drives fundamentals of kinematic calculation centrifuge..
- Gestion de la capacity / ecostruxure power capacity management.
-asco low voltage construction fundamental .
- migrate form legacy graphics ..
- physical infrastructure management basic .
-fundamental of physical security .
- scheneider electric approved ev installers ,it architecture .
- advanced lighting control circuit breaker in power control .
- security transition guide .
- discover wiring device : technical structure and application .
- internet 50 years innovation and invention that made it .
- computer history in photo album .
- digital economy movers and shakers ,your computer secret ..
- trending digital technologies

Quote bill material configuration :ID 607079d9-fa26-423a-9d8c-d810df173a87..

BOM level |position || reference |||| description ||||||quantity
- my configuration : 1::LMC100CAA1000.;motion controller LMC1000 axis ACC kit basic |1
- my configuration : ABL8SPS24200 regulated switch power supply modicon modicon power supply ,3 phase 380 to 500 V ,24 V ,20A..

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ID: afef9d8c-ed8a-40d8-8195-5009b9513968..

My configuration 1|bmxp34100,processor modicon M340,max 512 discret ,128 analog II
- Bmxcps2000 ; power supply module modicon modicon X80, 100 to 249 v ,AC ,20W
- BMXXBP0400 rack modicon M349 automation platform ,4 slots panel plate or din mounting .
.
.- ecoxtruxure motor configuration
I'd: 2990198c-6d29-4dcd-98e9-b41d442392222
Motor starter parameter selected .
- technology: variable speed drive .
-supply voltage : 240v .
- motor power : 2,2kw
- segment and process : machine manufacturers application standard machines heavy duty selection no
Breaker : sccr : 30kA.
Contactor
Coil voltage : 230V AC - 50/69hz ,
Coil type : standard ..drive

* Device | option | description
- breaker
GV2ME32 : motor circuit breaker tests deca ,3P,24 to 32 A thermal magnetic screw clamp terminal button control
- contactor :LC1D25P7 : contactor tests deca , 3NO) AC-3/AC ,3 e < = 400v,25A,230V, AC 50hz / 60 Hz coil screws clamp terminals .
- drive : ATV ,12Hu22M2 : variable speed drive ,altibar ,12,,2,2kw,3ho,200 to 240v ,1 phase with heat sink ..

Close

* - docu sign I'd =2872DD67-435C-4079-A408-3DE7221E2254..

Scheneider electric southern Africa ,ICA
From : Ahmed el besary Chanel sales and marketing Vo general management
- to valued channel partners
- to value Chanel .
- date ,20th November 2024.
Subject: price increase on power product family announcements letter : dear value due to increased production cost on our mccb family product with the power product division we are completed to inform you of a price increase on this range this range as you are aware we have maintained our princing on this range for the last two years , in lieu of this there be 6% price increase on our mccb .molded Case circuit breaker ,family product which includes compact NSX compacts NS compact ins / imv go pact and CVS this decission has been made after careful consideration the current market conditions and variousy cost factors .the new pricing structure will Comme into effect on the ,1 January 2025;we understand the importance of these product to your operationel and assure decission has been taken lightly our commitment to delivering exceptional value and support remains unwavering ..
- we appreciate your understandy and continue partner eshio should any question regards price adjusty please reach deducant account manager customer support team .. sincerely

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scheineder taken
- hi thank you again interest Scheineder electrical and the power systet medium voltage intern role we have on our team ,we wanted to follow up on the status of your candacy your application was impressive however yo we not selected to continue forward in the process .please do not take decission to mean we will keep your resume in our system and share opporty that fit skill experienced are posted daily encouray you to visited career
Talent team acquisition

____&&&&&
Eaton talent hub
Dear Thanku for applying the posity of field service engineer ups - 32511 we a
Appreciate opporty to consider your for employment with Eaton this communication is to let know this job has filled we invested you to visited ,www,Eaton ,con and apply other job opportunity bcurrent aspiration continue interested..

Financial sale
Assessment: engineering jacobien

Eaton university guide : module
Training

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Project :
2.1.30.,, 2. Project
Microsoft
- exam registration schedule registratt step certificati profile ,step discount ,step schedule ..
Certificate ..
Legale name,
- title student qualicafition academic discount.

Record training : achievement challenge credentials
- successful completed : introduction to data Engineering on azure..
- secure data and manage user in azure synapse serverless sal pools .
-;examine backup security licensing and support consideration for sap Hana on azure large instances.
- configure network security..
- perform device investigation in Microsoft defender for end point

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-title : case support case : visual studio
2403110060003192.
- service request # 24031100600003192 service VSS Engineering data portal closed data : 3/28/2024 advance

-azure test plan : azure Deb ops : congratulations and welcome to azure test plans : ensure great quality product by performing
started ..dev.azure.com/tshingombefiston0369
Project yeah

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Reward Microsoft chat Microsoft account
Level ,, 17 redeem ,point break. v,read to earn your business badgev,earn

Microsoft 360 business file : office gigaby driver computer link premium

2.1.31
- choose a charity go your goal

Microsoft training : 46307064 :
MCID : 99587175
900 badge|180 trophies | 0 reputation points | accepted answers | 0 follow | level 18 , 1,225,400/1,481,099xp..
Activity : training , challenge credentials ,q a achievement ,collection ,transcript ..
Secure data and manage user in azure synapse serverless sal pools ..

******"***"""

-fiston Theodor ,,
ID : 6743edd3-32d3-474c-a802-b9cfe8e2f3..
Is 2 candidate issue by : isc2..
-issued to : tshingombe Tshitadi tshitadi .
Issue on : 14 November 2023 ,expire

Official transcript issued on 22 November v..wwwcredly.com/ user / fiston . tshingombe, cyber security certificate ..

Brigth talk

* Certificate of attendance : certifie view the next generation of Sasse .10f 47 minute ..
- instructed data : one of the greatest gateway ransomware attack ..10f 38 minute.

_ security your company by avoiding these five cyber insurance pitfalls ..it security and compliance analyse presented.
- the high price of insight ::

- senior manager integrated marketing pure storage sustainability..

- see future with cortex xsiam 2.9 ..

- inside the mind of hacker
- generative AI and enterprise it : ovehped or radically underestimated
- achieving Dev sec ops : ways to reduce apps noise scale..
- how to address API security in
- public cloud repatriation which workload should go where
- generative and enterprise it : ovehyped or radically underestimated
- software due diligence .mitigating multiple dimension risk
- ESG in the C suite strategy ,policy governance and risk management ..

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Project ,
2.1.31,, 2. Project

Job - sarb
Registered on job site :
From : sysadmni : tshingy tshitadi
Send 2023 - 06-24,
ID =61095446

- confirmation : refferak requested has been sent successfully ,job IRC32431
Description ,job title bank note processor ,cash center jhb
Career sarb current vacancy
Programme bank note process ATM

Manufacture printer compact ,technical speciy : capacity happier 1000note , technologie speed ranger counting : 1200noye / Min,,

PCB manufacture
- visual basic ATM

File ref no 3/4/TT/tshitadi/tshingombe
Letter of appointment position 98 artisan electronics CT March 1
successful .. cash center department

- robot process automation engineering BSTD ,,

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Sars screener .
- survey conducting screener assessment capture results outcome sars sars psychometric assessment b

- sars : important please add delete code Portofilio maintenance member teab regret application ..
-;sars talent acquisition team :
Sensibility:
Code # a1bb5f53989164c33ea37aa428ea0931c$...

Job title | action | Rea I'd | data applied |®statue ,region location ..
- analyst data report auditor , auditor compliance lev3
- tax
Consult hr business
- consultant legal ..
- debt collecy estates
...

Project :

Application for evaluation of qualicafition and experience to comply with the requirements of the national diploma .
Name of applicant ..:
I'd number ::
Name of get instituts :
Qualifications title:
Minimum credits:
NQF level:
- date submitted to dhet:

Academic information : application
1.1 instructional offering passed exempted acknowledge on n4 ,N5,n6, level for national n diploma ...
Examination center number | name instruction | obtained ||| levek | data passed acknowledge
Qualifications title
Minimum
NQF level
Date experiemental

Pratical experience: achieved , theirical experi

Two instruction vocationell ,I'd ,n certificate ,university academic record in case of exception ,letter from employer regarding workplace experience
-:workplace experience :
Name address of compagny | registration of compagny | contact hr detail | position held | primary duties | no hours per week | no of months | signature supervisorv
 Experience must be relevant of minimum of 18 month pratical

, workplace experience to qualify general study diploma and 24 months of pratical workplace experience Engineering study diploma ...
3 trade test learnership certificated all saqa to verification establish the trade / learnership I'd ..
- trade I'd | trade code | trade name | industry

Report tolerance report irregularite be aware of dhet fraude ..

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4.
- appeal statement result award diploma certificate n diploma dhet
Application : referrals : application letter number 2023/1226
-addess : private
- enquiry number :
- docket number 2023/1226
- institut college name:
-:I'd : number :
Reg:
- sars vat:
- saqa register :
- email address :
- alternative email

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Appeal decission result release application ;
Sawa instituts foreign transcription meeting 72638 Congo requirements graduate award diploma NQF high certificate no meeting leave school expended assessement exam d etabdiplom NQF high certificate information informatics mathematic officer result outcome primary status registration saqa asset 0912 saqa institu 30-39 NC assess policy IE099,saqa I'd 67 certificate advanced phase teach n 2 saqa I'd 63375 I'd 67491 entry diploma

,
Qualifications title national n diplomat eny NQF level 6 date submitted to dhet : 1105/2023 date process dhet sat 10 March 2023 qcti certificate @ qctib.org.za answer please note qci does not issue any result .lindiwer grace 28 may 2023 inquired to national and assessessment college I have copied our QA unit the will be able to respond to accordingly regard ..wcti khuluvf labour intelligence lmi esteemed stake 21august 95 was not granted
- I receiving allegation to saqa retain 10 March 20203 procedure for evaluation pro forma invoice copy I'd copy final award gradut certificate copy of completed transcript mark sheet academic record proof payment if not meeting requirements can resubmitted again non complain ,27 July 2021 application above does not meet saqa final award school diploma certificate in 48h ..
-that my request to authority minister for result statement certificate over the date review n diplomat 24 month 18 month nated examination to resolved problem after examination irregularite material material that final result n4 and new re certificate body insurance investigation result center assessment outcome years icass totaj TVET for my instituts St peace college print out was not in my application for diploma response from dhet submitted to resolved print out was not in my application for diploma response from dhet submitted to resolve conflict assessment examination..
- your sincerely
The

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Project
Low motion notice appears
Irregularite low outcome results on ammandement script : deputy chancellor minister council academic .
-Enquiry : to national examination and assessessment college principals organisation chief invigilator commited iirregularity.chief directorates national dhet ,and saqa evaluation ,qcto registrar Mo
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Student ID :
Student name:
College institut :
Exam .national .
Memorendum:
Requested letter reasoning for : release finalized n diplomat studies engineering electrical :

- good day dear ,I'm apply to claim for attention in your department and instituts to regarding my apply in consolidation ,release of November examination to verify the outcome of iirregularity observed the quality insurance bodies responsibility for TVET qualicafition n diplomat Eng studies electrical engineering.
- didn't have received the letter approved release November engineering studies subject under investigation and invalid subject n3 trade electrical theory transcript registrar ti k sign to day of exam n 4:electrotech chief invigilator and assessment deal with 21 days of publication and consider all evidence available make decissy base will notify the examination as soon it possiy it finalized candidate fail to submit addiy information receipt statement submitted number 1980 / 11/10 ,notify 1982 /11/10 n4 fail druip review statements N1,n2,n3,n4 statei
Release marking scaling marking scale submitted Portofilio evidence Poe's engineering electrical time table college private system assessment police evidence docket document examination reference student examination semmester 4 Portofilio online send additional information system to saqa institut foreign award meeting required documents completed exam dhet framework ent electrical icass evidence based topics scaling process online meet award certificate investigation document police criteria council quality meet conductor assessessment police and ent council dhet we alert your atten in department busy conducting subject investigation and envisaged the result will release by it responsibility inform that candidate release subject on line department labour electrical eny still busy finalising the mechanical of ent examination script plant ent the results in certificate all effected candidate portofy labour exoerimy I ass in circulum saps seta sasseta CETA verification for trade practices panel electrical wiring plumbing in trade ..base ent design investigat .additiy information evidence base .
-examination national irregularity committee n 4 - n6 ..n1-n3 appealing process and activity notice letter to get institt notify candiy outcome of the meeting closing date registratt final submission of script letter 21 days affidavit submisst and final .
- ref : all effected candit who do not receive theirs result immedy must be registered rerwitent subject during next examination cycle as not late entre will be accepy in Portofilio assessessment topics and completed submitted additional information syst and the application proof must be submit a register must be complied on the the template provide send to the owner no application for remark received after close date will be deemed iirregularity and not be processed examination offer the according to national conduct policy the script may be destroyer 6montg after the release of results for business month for ent no applicatt for remark re - check of will be accepy beyond and received November ebruary 2023 exam cycle and all candidat who pending outcome result for next examination cycle no late entries will be accepted .code 1104126 subject electricak trade theory level ,, reason under investigation the process in Portofilio evidence topics learner in saqa

document meett required thank u for attention..
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- project :
2.1.32,, 2. Projec
-application
Ref: application letter number : 2023/1226
Enquiry:

-;dear minister of education dhet and deputy member of dhet TVET college examination ucpd directorate and authority competencies goverment president .
I'm Mr tshiny tshitadi : acknowledge student St peace college candidate examination career student follow course duty of nated ucpd in RESA 2019-2025 I m appear to your department goverment institution for allegation view no result of statement ID candidate Engineering ,n1,n2,n3,n4,N5,n6,n diploma saqa framework NQF 7,8,9,19 ,, saqa outcome outcome irregularity final ,N5,n6, examination national examination was not delivery in the time external assessessment commited iirregularities..aware
- 1 my motivate and disciplinary assessmy submitted my port on line portal dhet release result statement and finalize award diploma by examinatt committed irregularite November invalided subject n3 trade theory electrical transcript the result of assessmy was note release reason irregu n3, subject n4 subject fall druip result febry 2922 directorate asssessment transcript material statement Ffidavit submitted St peace college registrar shalom technical and Afric institu college no result outcome after 15 day was result scaling n1,n2,n3,n4,n5n6, ..NQF 7,8,9
Statement didn't come outnot print out by registration re statement inconvenience arbitrary iirregularity on February I submitted topics saqa dhet email result of saqa documentary ,fillit DBE ,dhet the committed was under invest soon finalized ..
-2.1 received to dhet commited asssessment examination irregularity retain invalid b subject 23 February 2022 the time table of n3 subject administration exam with those subject trade electricak theory 4 subject November 2023 examination shett result statement for last examination was not print outcome n2,n2,n3,n4,N5,n6 submitted n3 time table exam only last exam statement print outcome table for n6;,n ,NQF 7,8, received in examination November suspension is 11 month for irregularity follow TVET guidelines assessement
Exam over the date insurance body framework qualicafition and labour department if void claim no outcome in career portal was outcome granted national fund skill for extra subject topics irregularite writing praticak not

granted scope research ..
- 3 allegaty result statement retain dhet saqa n diploma n diploma for n 4,6 diplomat final was not granted n 4 diploma years college in my porty submitted on line marked exam ,N5,n6, NQF subject assessment information by institut ..
- 16 Jan 2003 merishen message send submisst number foreing instute inquired 9379 foreing institut verification inquired section 29(a) policy criteria saqa amend March 2017 institute framework award must meet for recognise saqa accepted only..issue statement school leaver country dr Congo qualicafition official examination body country external examinatt based 26 July 2022 ,saqa mrs gobenie aware system cellphone , ..December 2024 saqa ratification experiemental career aware application n diplomat work based ..finalize done all application on system transcript ... ratification work , I'd engineering n diploma ..transcript record buchellor degree
- allegation to qcto retain on Saturday 2 January 2022 wih 22 2023 with regard
Regard n certificay direction dhet education training for n4,6 NQF or umalusi not assisted issue ,sat 19 March 2923 answer SoC please note that qcto does not issue any of result lindii grace 28 may 2923 inquired to national and assessessment college I have copied QA they will be able to respond to accordingly regards .intelliy
- I receivii alkegegay to saqa retain procedure evaluation lro forma copy I'd final award graduation certificate completed markshett record lroof paymy if not meett reqyiremt can resubmit again complain 27

- application a I've meet saqa .final award school diploma degree certt in 48 h that my request letter to the ajthoryt mister statement certificate over date review 24 month ,18 month nated examinatt to resolve problem after examinatt irregt material that final result n 4:new re certificate body insurance investigay result center assesment outcome years icass totaj TVET for my institut St peace external n #,n3 Afric training and shalom college print out was not in my applicaty for response

In Sita project complain umalusi result outcom backlog project after release result on March 2024 and NN diploma finalize application engineering combination record final records on intelligence system investigation diploma bachelor's and trade lecture, Engineering NQF 7,8,9 diploma Steel waiting and response resend ucpd Mrs Maraba waiting register paid for institution foreign ucpd to granted aware on dhet minister nomination diplomat .
Years college mark allocation exampted
e TVET chancellor secretaire deputy policy . Assessor moderator seta LMS sasseta edpseta on circulum CVS survey processing examination saqa answer completed n diploma ratified nated ratified ..nated aware automatic

- An ,n3 in relevant special specialisation area communication NQF level 8,7,& language teaching thereoticak knowledge and praical skills requirement requirement and learning of institut offering to award the award learning to choose completed business studies ,0,5 years studies ,n4 n 5, duration credit ,n 5 0,5;years duration ,60 credit , n6 ,,0,5 years duration , 60 ,,18 month pratical in case month pratical n diploma 360 credit award to experiemental training business programme code n diploma engineering vstudie electrical nqfv,I'd 90674 national eny studies electricak engineering NQF level ,credit..

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Project low
- appeal process acadey section
- student : name tshingt
- qualicafition: saqa record academic inst foreign .
- years of graduation : 2020 to 2025 management system informat academic years policy dhet policy number saqa yet policy peace college quality system management lmz .
- referral registray attandat record irregularities material transcript and script submisst statemt and evidence years 2022 ,11 months Feb 2023 register acadey college basic and ady nqf policing criteria years 2022..

*From ,,tshingombe
To dhet deputy minister member of academic record .
- saqa and college rectorat instut .
- dear is tshingt and I attended event from to in there write to request for my transcry to apply for father adulation wish to express my sincere gratitude to your education I wish to express my sincere gratitude to your dhet college TVET have helped me in my professy I wish to take studies at foreign institut sqaq and college education advanced field continuing assessessment professional instituts has required a full transcript from my former studies to check my ekigibit to studies the course I hope saqa to started my studies on and the dealing time I herbed provide .
-;in effected irregularite transcript material February 2022 need submission statement dhet full completion and finalise marks out term the homor for me to be part of this excellt institut since mention periods and instiy workplace soon process I would be great full to you if you send me requested graduation years..
I hereby request for transcript students in journeys from I graduated alumni of esteemed succey career experit CVS on line student reseat .
- section :
Ref : to maintaining record of academic achiet dhet St peace in order maintaining accurate system student record lesson transcript student .
- students record : attandat dhet nated years saqa years entry national framework qualicafition award degree diplomat graduation enroll course ..

- academic perfort record
  topic system ..
- research papper : college system , management ,, engineering studies Portofilio and assessessment
- methodology : description login topics and research college son lines admit upload information view marks exam ..
- advantages : the software verification on line topics in trade national examinatt informal and policies submitted on line framework qualicafition quality NQF submitted supplemtaire need to be record earn reward honestly result processing best to try again and to reprinted diploma certificate again Consol inspector information management system download record registration storage ..
- registrar next stepped record keeping eaeninyb value compensation on line Microsoft database system collection and record process casebook bass book examination topics reward Amandment open view book copyritg exam submitted returned explanation student topics challenge textbook..

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*Weigthing of courses:
- certificate engi studies n diploma
- course in circular. | Weighting of course
- industrial electronics n1
- engineering drawings n1
-electrical trade theory n 1
- mathematics n1
-electrical trade theory n1
- mathematics. N
N2 scaling placement ,n4,5,6
- industrial electronics n3
-electrical trade theory n3
-engineering science n3
- electro - technology n3

Industrial orientation n3
- electrotechnology n3
- plant operation theory n3
- electrical trade theory
- electrotechnical n 4
- industrial electronics n 4
- mathematic n4

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Saqa I'd credit n diploma wehting
- engineering electrical :

- assessenent moderator: award not meeting

NQF 7,8,9 lecture / learn
- lecture/. NQF ncv engineering electrical final qualification framework ucpd

Lecture electrical. trade theory :30
Lecture electrotechnology :58%pass
Lecture plant orientation:
Lecture orientation industrial .48
Mark 50% pass 40 pass
Lecture irregularity award ..

Nqf assessor mark allocation peer ,self group discussion mark submission
Survey completed note% ,exam quiz %
Policy :

Training record experimental application
Appreciate .total marks point score
NN diploma
Advanced ..basic
Award institut mark registration license issue

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- certificate | census day enrolment | credit € get total student

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Subject / course | weigth | scale topic completed years homework class | credit n diploma ..

- industrial electronics n1
' Engineering drawing N1
-electrical trade theory N1
- mathematic N1
-Industrial electronics n1
- electrical trade theory n1
-mathematics N1
* N 2 scaling placement N5,n,6,n7
-.industrial electronics n3
- industrial electronics n3
- engineering science n 3
- electrotechnology

-industrial orientation n3
-plant operation theory n3
-electri technology n3

- electrical trade theory n3

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-Electrotechnics n4
- industrial electronics n4
-engineering science n4
- mathematics n4

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- sub total credit quality
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- irreguy final mark script materiy evidence low assessessment progress marker .

- N3 final certificate
- electrical trade theory n3
- Electrotechnics n 4
- industrial electronics industrial n4
- Engineering science n4
- mathematics n4
- electrotechnic N5
- industrial electronics
- eny science
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- electrotech.
- industrial electronics .
Mathematic
Total rate : 100% ,,,1300%+1800
1300+1751
- full time equivalent. 3051 % ,,1900
    0,30×29=9,57

- pratical panej wiring electrical plumbing ..
- accredit
- required infory | submitted yes) not | institut comment

- annual report form :
Termination agreement with instituts
- the disclose certificate as issued by cipic director ..
- college name :
I'd number students

--section appeal process :
- report on error in marking guidelit
- name of marking center :
Engineert date subject ..
Marking system allegat enrolent resulted submitted mark term sheet on line

base system information student learner instituts college Afric institu police error assessessment submission award institut register school framework database system from stationary Portofilio and examin assesment rerwiten November cennter not enrole in marked guideling was not appropriate stationary and marks out and retain session ..number marked effected was not marking ..

...

Project
- chief directorate for re mark recheck application engineering n studies n4,n6,n7 assent
Chief directorate national examination of assessment .
- order from for examination material script ordering and extra material..
Code | descripty quantity. | Issue
Boe .| Engy n studies information sheet |
Boe | application for transfer of entry
Boe | cycle semie log papoer abstract papper .
- Boe |™billing papper
- Boe | answer s dipt papper exam draw .
- Boe | mathematics ,electrical trade theory ,electrotechnic , electrotechnology,entscience ,plant operational ,industries electronics ,ent

_____
List stationery
- item code | balance store | prior
_ | mathematic ,electrical trade theory electrotechnic electrotechnology ,mechanotechnic,diesel,building science ,mechanotechnilogir diesel ,control logic ,logic system
Time table examination subject

_____''
Project
Result of result.
1 outcome scaling : medium short long. Script ,,

1..Outcome resulted department dhet

- enquireme t :
Referencev: invalided subject 2022 November / 10361
- the rector : shalom technical College Pty Ltd 89993815
Dear sir madam :
Alleged examination irregularity : November 2021 examination ,electrical trade theory n3 papper ,candidate tshingombe tmf : I'd ,exam / 21000000202812
- an alleged irregulari regarding : technical problem with scripts /
- was referred to the irregularity committee of the chief directorate national examination and asset for investigation chief invigilator ,in igilator and cabditiin are requested to kindly submit statement , affidavit or any other additional evidence of the chief invigilator and the candidate to chief directorate national examination and assesment with 21 days of publication
- the irregularity comitteebwill consider available and all report relating to the irregularity and make a decissy based on these we will notify the examinatt centre as soon as it is finalised.
- if the chief invigilator and the candidate fails to submit additional information the irregularity committee will make a decission as to whether the candidate is qyilty or not the candidate must acky receipt and copy must be forwarded to the chief director national examination and assessment..
- please inform the candidate accordingly ,your co operation in this regard is appreciated ..your faithfully Mr m kgska ASD ..
Directorate get examination assesment college .

___

Irregularite finalise marking progress candidate must register next step in progress marking ..n4 ..register n6 final rwiten ..add. Irregularity aware certificate irregulaty diploma

_____
Result outcom record. ..record result

Project Sita backlog

- release resulted appeal statement
-incident INC000025277051 reported by you resolved request assisted from DEP of Giger education and training .
Itsmprd @ Sita .co.za
Dear tshingombe fiston
We are pleased to inform you that your reported incident has been resolved.
Ref: no : INC 00002527705
- summary : request assistance from Dept of high education and training .
- your reported incident has been resolved with the following resolution. :the n3 statement of result for 210002023812 for the 2023,/11 exam was released and sent to shalom technical College on 01/02/2024 way bill number 080057034873(sky net couriers) candidate does not qualify for a

certificate as he did not pass all subject .for a diploma to be awardt as per the complain a candidate must achieve n4,N5,and n6 certificates and also have the relevant experiential work ,the submit the Application at the college the candidate does not qualify for that complain was responded to via an email..please do not hesitate contact service desk should be Any futhure question or inquires regarding your incidence ..

_____

Sita project candidate
Fail 2 subject and first n3,n4,N5 n6 and pass 2 subject second papper irregularite papper landing papper resolved combination ..first.fail 2 subject and write pass 2 ,1 subject finalize

_____
-INC00025277051 PHL enquiry ..
Nhleko Gugu ,nhkleko @ G @ DBE.giv.za ..good day the dhet has received the below enquiry .
- kindly note that according to the records for this profile 2100002023 the results for 2023 were released and sent to shalom technical College 01/02/2024.way bill number 080057034873 ,sky net couriers candidates does not qualt for n3 certificate as did not pass all subjects ..
- for a candidate to be awarded with a diploma as per below complain the must achieved n 4,N5, and n6 certificates plus relevant work experience then may submit the application at the college..
Regards ,Gugu nhkleko
_ complain about : service
Person / ministry / municipality : departmy of higher education
- preferred contact : n/a
-any other contact number :n/a
-email address : tshingombefiston@gmail.com
- fax number : n/a
- I'd number : n/ a
- ref number : n/ a
- office where you complain : n/a
- street : n/a
- build name : n/a
- city : jhb
-provincs : gauret .
- date of complaint: n/ a
- names of people not delivering service n/ a.
- where did it happen town site municipality: n/ a
- types of service .

: citizen is requesting about the release of results statement and to award a diploma .
- student ID : 2100002023812

- student .name :
-college institut ..internal Nd external ,St peace college ..
- Afric policing instut .
- memotent : 2023/0508..

_____&
Preferred number
Email
- fax number
- I'd number :
- office where you complain
- street
Building name :
- city : jhb
- city : jhb
- office contact .
Date : 12 Feb
- date complain of
Where did it happen town. : in shalom technical College and Afric training .
-:type type service : retaining statement I'd Africa college training and irregularite transcript febrt was suspended n 4 exam time and marker in tigress for N5,n6 after 18 month before resulted n 3 2023 November was exam July 2921 shalom technical result retain and didn't collected proof irregtwas time table in novet 2021 febryt the marker asking additit infirmatt for assest and statement to submitted but submisst previot pappers examiner marking and completed n 5 ,n6 test memo for irreguy investigay case book I'd enrollment citizen saqa award degree school leaver Congo to complex same subject electrotechnology and industrial orientation meeting required saqa n 3 to topics research submitted for irregi in saqa pratical assessment in saqa 21 days , 21 to 2023..

_____

* Re appeal statement result award degree diploma certiy n eny studies .

Lindt ,sonnika ..
Kindly note that ms Maraba and ire no longer with the office of the minister ,kindly contact call center dhet ..Rs sonnika lundt ,

Universitycapacity development
- department of higher EDUCATION and training
123 Francis Baard street Pretoria to
Lindt s@ dhet.gov.za

Background ucpd : project cost
Marker exampted nated in university

Marking sheet exampter

_____
*Project outcome resulted

Automatic reply : letter explanation theoretical pratical bass work n diploma award ent electrical .
Section 1.. compagny application irregularite work of the work exampter sciebono. Scheneider Eaton city power Eskom Microsoft lm council engineering
This letter serves Mr was participation in the worked integrated learnit programme of department : research assesst irregularity national examinatt nated n 4 to additional infor and workbased on visited circular pratical external on line job work pratice on department of energy mineral compagny career CVS and industrial portal council work ,city power day visited on line Facebook ,Gmail badged completion career 28 day appointment sarb career engi artisan electrical electronics Microsoft schet career certificate ,Eaton electric dtic day protect ent sasseta Sala career mil ent career metropot
Section 1:

- call centre via dhet gov .Za on Microsoft.com .
- please note that this is an automated response do not reply to it :
- thank you for contacting the department of higher education and training call centre .we appret your enquiry .
- regarding NN diploma nated and ncv certificate enquiries .
- all application for new issue ,replacements or combination requests must. be submitted directly to the relevant colle .
- please note that there is a minimum waiting period of 3-6 month for diploma application .
- the issuance of N.N diploma is currently paused ,we have communicated this to all colleges ..
- in the meantime students whose diplomas are finalized but awaiting printing can obtain a confirmation letter from their college ..
- we apologize for any inconvenience this may cause and appreciate your understanding.
_____&&&&&
Re : letter explanation theoretical pratical base work n diplomat award eny electrical ,jxl6wjl31fnjy17wwmwq
Outcome DFA Tue Nov ,5 ,2 : 2:38
- dear Mr/ ms fiston :
Thank four your email thank ,please note that application for evaluation of

foreign qualicafition is done online
Kindly use the link below for the application of evaluation of foreign qualifications,all application are done online ..
https://dfqeas.saqa.co.za/dfqeas/ user/ home ..
-attached are the guideline for application and the country specific requt ,be aware that the maximum turnarout time for completion of the evaluation is 90 working days kindly note that our system is not compatible with the iPhone ,iPad,and MacBook,your are advised to use other devices ,ensure that your default internet browser is Google Chrome and that your are connected to mobile data rather Thant wi -fi
- kind regard .ms makebo ngobeni ...

- ratification . verification confirmation @saaa
NQF informatt centre NIC

Release resultat statemt and finalize award diploma irregularity .Cass
- the internet archive team internet archive support Zendesk ..
- you are registered as cc on this request (1135821) reply this St to add a comment to the request .
- the internet archive team .
It's dispiriting to seen that even after being made aware of breach 2 weeks ago ,I a has still not done due diligy of rotating many of the APU keys that were exposed in their gitlab secrets .
- as demonstrated by this message this include Zendesk token permis to access 800 k+ support tickets sent to infoa@ info@ archive .org .since 2018.
- whether you were trying to ask a general questt or requesting the removal of your site from the way ACK machine ,your data is now in the hands of some random guy if not me it's be someone else .here shopping that they I'll get their shit together now
...

- project
 based : dhet khetha
Record assemement career
-national career advice portak ncpa values questionnaire resulted
Thank your embarking othis journey self exploration assiaf you determine career value based answer ncap value value
- item : | description
- spirituality : judgement
- completion : work in environmental is measured Gain other your reward for performing better than other .
- money : job earning

- appreciation : value person but interested in meet the requirements of the job and being rewarded for such ..
- fun : formal and organisation .
Affiliation: it important for goworj not associated with the organisation .
* Question to task yourself :
- action plan overall value : that have your value in the job market do following
- action and description
- watch career video ncP evaluate your top 3. Areer Choi d ..if you are not sure which career you want choose completed

_____&&&&_
Evaluation foreign qualification check list team
Application check list:
Application form online
Document | submitted. | Not submitted
- quotatt / payment ref.   Yes
Document in foreing language : yes

-issued by official external body:
Issued by official external body statement level: yes

*School qualicafition/ general university entrance qualifications.

*High education qualification
- final award degree diploma certifie : yes
-certificate or statement
Transcripts of academic record reflecting each years of study ,yes
-
School certificate report :
Examination..
Country China
Verification qualification ..
Country school leaving certificate :
- translation of baccalaureate .
- attestation de reusite bulletin note relieve .
- diplome d etat

- RSA : professional short course ..

_____&_&&&
Low
Outcome of complain as lodged at   oigi
Inspector general of intelligence

Subject .. shivas
OiG/IG10(IG80)/6/1/14/5
Dir do 7:12538,
- 5 August 2024 ..Mr tshingombe ..
Dear Mr fiston :
- re : your complain peetainit to allegay of deleted college record from your database :
- 1 acknowledge receipt of your complaint as received in April 2024.
-2.I assessed the information provided and found your complaint does not fall within the ambit of the mandate of the office of the inspector - general of intelligence (OIGI) in particular section 7(cA) as outlined in the intelligence service oversight act 40 of 1994 hereinafter reft to as the oversight act .the oversight act reads as follows .
- (7) the function of the inspector general are in relation to the service .
(a) To monitor compliance by any service with constitution applicable law and relevant policies on intelligence and counter - intelligence .
(B) To review the intelligent and counter intelligence activities of any service .
- (c) to perform all functions designated to him or by the president or any misiter responsible for a service .
-(cA) to receive and investigate complain from members of the public and members of the services on alleged maladmnistrarion ,abuse of power , transgression of constitution law and policies referred to in paragraph (a) the commission of an offences referred to in part 1 to 4 or section ,17 ,20 or 21 in so far as it relates to the aforementioned offences) of chapter 2 of the prevention and combating of corrupt activities act ,2004 and improper enrichment of any person through an act or omission of any member
Re: your complaint pertaining to allegations of deleted college record from your college database :

_____&
Incidence logged on 2024/07/29..2;28 pm UTC 02:00 Africa Johannesburg was resolved on 2924..

Csd@treasure.gov.za
Dear are commited to provide excellent bcustimr
Summary :
Customer name
- location
-prioriry .
-statud :
- category .
- resolved on

Description : forms diploma award certificate national framework

qualification Engineering design studie time 02:9;..point need review .
- question :
CVS kheta

___
-3 in light of the aforementioned provisions ,your complaint does not fall within my mandate .
- kindly consider moving your complaint with the dean and ICT security of your college .
- thank you ..
Your sincery Mr I Fazel : inspector - general of intelligence

---_____
-alison : learner record
Learner details :
Name : tshiny
Email : tshingombefiston@gmail.com
Country : RSA ..
Total study time :

- mave Richardson : director certificate

- Alison :diplome cpd
This to certify tshingombe Tshitadi successful obtained
Mave Richardson date award

-completed diplome in electrical studies 12%
-iso 37301:2921 principle of compliance management system :91%
-;advanced diploma of electrical technology and circuit analysis : 3%
- theory electrical engineering diplome .

* Block mark registry : certificate ..technology
Issued on Thursday 18 January 2024 ..
Certificate I'd : C9c8583a-3e9d-4d98-982-070b1bd56058

...

-project
cds:
Querry
- national treasury ocpo serve confirm of query / issue you raised regarding

your CSD .
We kindly advice that email address is reserved for CSD supplier support querries for city power plant queries we kindly advice advice you to contact the relevant depart in order to assure for futhure
- the following new incident has been logged .
-the incidence : 1573951
- summay : re visited work engineeng electrical in city power training power training visited visited observation working student Portofilio .
- customer name : tshingombe tshingombe .
- location :
- location :
- priority : 5
- category : bid contact enquiry .
- description : 2023 / 08/ @4 ,,@0:03:21

- -------___
- incidence : 1579970
- summary: re : release resultat statement and finalize award diploma irregt Cass re marker
-;customer name
- location
- priority :3
- status : logged
Categories
- description ..

Resolved according incident : 1573927

_2.1.34,, 2. Projec_____
Project : health dep
Doc envelot I'd : 7cff6ce8-491a-45c99caf-c7924732E3E3
Rfq (20022/ndih-0809)
- appoint of service provide to supply and deliver rdx 320 vacuum autoclaves ,part number 016000..
1.introduction : health is safety security. Machinery system hazard incien e occupation life nurse treatment to play a breather role before , both on the global stage and in lives of RSA health more than police statistic ,labour intensive,robot neural intelligence system. Promotion office care .. imaginary radio scope. Forensic detective sector government .
2. Background: health RSA create condition sustay grownth regulation measure rationality sector million direct opportunity workforce economy ..
3. Scopes of the projection :
The departmy seeks to appoint service provide supply and delivery rdx 320 vacuum autoclaves urgently to be ,

- special conditions : all vacuum autoclaves must be as per the specify .
- all order item should be delit on or before the delivery date stated on the order form .
4. Purpose of this document : the purpose of this dicuy is to outline to poteny service providers ndoh requirements in as for as the rdx 320 vacuum autoclaves concerned and to ensure that potential service provider can submit informed proposals on the required autoclaves including supply and delivery .
5. Budget :
- a project budget ,including supply delivery and off loading vaccum autoclaves outlining a scheduled cost associat with the proposed project should included quotation all monetary value quoted in RSA rand must value added tax vat :
- project budget should not exceed R550,000.00 ,five hundred fifty thousand Rand only vat .
6. Time frame : the project is to commence in Monday March ,14 ,2022 the successfully bidder I'd expected to deliver an official order stating the commencement date and delivery date will
7. Specificatt : outline of required of project :
Item:
Part number : 016000
-perfofmancd : water - fill
- size : 23 inch
- model : RDX 14 l class B
- flow : inlet - 2×1/2 in ,outlet - 2/1/2:..
-
8. Requirements for service provider
8.1 a quotation for the service cost should include VAT and where possit should be linked with specific task to be undertaken.
8.2;warrenty periody should comply with specification .
- 8.3 a service provide should comply with the specification .
8.4 a valid tax cly certificate should a c
accompany .
- 9. Submission of quotation : the closing date for submit of quotaty is Thursday 17 March 2022 ,11: 30 ,, 2025 ..March department supply chain may
- delivery address
- 11payment term : full payment is made 3-5 five working days after delivery good
- princing schedule : profession service : only firm prices will be accepted non firm including prices subject to rate of exchat variations will not be considered ..
Name of company : en tsh

- quotation number : 2022/ ndoh - 0809
- closing time : 10:30. Closing ate : 17 the march 2022

- comment :
- item : 001| description of goods : rdx 329 vacuum autoclay| part number: 016009 | quantity: 39

- quotation must be submit
- evaluation criterion (80/20)
-
General notes :
Reserve rigth not accept lowest proceed project all cost service preparation of the project for ndo

- request for quotation number :
Invii to quotae ,supply and delivery rdx $29 vaccum autoclaves :
Item001 | descriptof good | quanty | price | bid price inrsa currency
Total include :5009

Delivery periods ,yes or not
- prices yes / not
Is offer strictly yes / no
- if not state deviation
- please note quotation has been received ..send suppliers manufat rigth system ...

...

-**2.1.35,, 2. Project**
cproject
- national skill fund ..
- phase :
- project name : engineering electrical n4,N5,6 assesst police implentation.
- name of the applicant : tshingombe .
- NSF ref no:
- phase indication applicant completed declaration yes or not ,
- availy tax declaration certificate yes or not
- registeration compagy ,yes not
-application completed involved in project yes or not .
- The budget submitted correct format budject not

- Project summary:
Title project : Engineering electrical n4,5,6 asssessment police implentation work. Buchellor master

1.1 goverment : issue energie rurale disposition framework traing
1.2 project location province : jhb Gauteng city
- 1.3: project site : jhb Pak station
Skills programme learn| estimated benefice || province || district || ,physical site address | gpa coordination.
- plant production : energie rural ,5000009 | Gauteng | jhv | college St peace
- beneficiare :
 Province | site || black | white | total

Grand total :
.- project. Budget :
Budget required NSF

- budget item | unit | cost per unit | tatal
Learnership

1. Production NQF .d
- skikk programmer
- learner alliance .
- skikk programmes non credibearing
-leae ER allowance 10000 Ped day × 5 days .
Subtitaj project
- project management ,7,5%
- uif @1% learner ship
Xoid @ 5,5 learner
Total NSF
1.2 project duration : 24 month expected start :
-january end December 2026
- project activities :
- nature of activity / program | learner intake || years ||| years 3

- application framework project proposy :
Plan memorendum agreement :
- 1 background : training skill Engineering master key economic main skill supply transformer issue
-

- 2 project o jectivites :
- overall objective : sociaj economic employement engineri electrical sociaj or community might parcticularitie employ growth develment plan and support si ial developm skill action plant I should reduce unemployment youth disability and goverment national priority challenge

- specific objectives : description ..
- project beneficiare : training work opportunities approval sector .

Rural.
- project results :
Expected impact beneficial .
- multiplier effect : the P
- sustainability exitplant :
- sustainability and exitplans :
- project activities : sequence time framework
- project delivery | activities | time frame | responsible | cost ..
- project implet plan:.

Main activities : Engineering sector design discovery investigat framework qualification .
- output monitoring ° framework qualification outcome design
- time frame : objective qualification meeting agreement sector rural in real framework design
- resoinsabily: goverment
- detail cost vulvarisation : multisectorial
: recruitment selection earning delivery ,coid uif disabilt sector rural :

Plan objective .
Main activiy : engineering electrical assessessment circulum. Output ,time frame 8 h ,responsabilty trainer ,cost 50000
- applicant capacity management project :
Technical expertise qualification workstat list off available and suitable for the programmes proposed
- 7 . Project governance and administraty : education goverment development social and education support help financial energy industry support assistance plant
- project management : project personej assessor moderator sector rural low sector help financial assisyv;
- stakeholder analysis: lartenershjo
Role in the project facilitator engini : intrrsf ,impact project industrial
- formally : approach systematic design engineer to realise ensure good that job are reduce factor ,
- indentifying source risk :
- analysing risk : rural sector non proliferation real place
- mitigation frist
- contingency plan: safety system
- risk description : learner | like hoo risk occured learner industrial | impact risk occured € severity | own | migration
- name of project : eny electrical n4,n,5,n6
- project budget and quarterly cash flows period :
Budget tails
Budget item € notes | unit | cost ,1 quarts

Learn engineering
Total NSF
Totaj NSF drawdoe other contribui
- partensrshi statement :

...

- project
- industrial
Dtic
Compagny name : tshingombe engineering
- invoice number :0011111
-invoice date : 01-12-2023
-invoice amount :R20000000
- service delivery date start : 01-12-2023

-service delivery dates and : 20-12-2023
- order number 0011111111 the dtic contact ..
-payment process information :
Submitted date : 01-12-2923 ,
- status : referred back and cancelled
- processed date : 01-12-2023
- referred
- invoice Pre check precheck .

- question :
- are the bank details on the invoice yes
- done the bank details on CBS correspondance to bank detail on the invoice yes .
- is the description of the goods and services rendered indicated on the invoice
-are the invoice totals correct .
- does the vendor name match the name on the order .
-is the invoice dated .
- if you are vat vendor do the words tax invoice appear on the invoice .
- if yes is the vat registration number indicated on the invoice .

*
Invoice number | statusf | submitted date € order | action
*
-2.. thrip claim technologie invoice reconciliation sheet ..identificatt payment

made against the invoices submitted

|Years milestone (yx-mx):2023-2024 ||
Date of invoice transactt || supplier description |||| detail of service / product deliverable 2x work benches ..|||||cost of service product ,vat exck :2000000000| bank start number date transactt | if source connected party please indicate : cost type to which invoice belong and as approval bursaries consumable ..

*3 technology and humain resource programme ,(thrio ..milestone report .
-applcant name | tshingombe Tshitadi
- project name : Engineering electrical impleny trade eny gov .
- project reference number| 111111
- project descript : implantation frNework circuit college St master degree saqa framework qualicafition engineering electrical ,gov system assessment police trade in city power Eskom .
- sector : jhb
- project site | jhb
- project owner leader :
- BEEE status | levek
Date audit .
- original approvak total amount .
Claim stage
*3.1 shareholder compagny structure member trust :.
- incopr no I'd share older member :
- race :
- gender male .
- disability yn
- youth ,@8
4 section progress on milestones : progress on activite expendure and reason :
-milstond XYZ
- milestone activities item : progress item | expendure | reason variance

- applied research activity :
- students bursaries.
- graduated .
- use of student involvement incentive .
- reseat involve in the project
- physical relocation of research
- contractual deviation :
- general comment opinion technical merits of work project risk observe :
-:section : support document to be ..
- certifie of copies payment as per appendix
- proof contribute subsy

4. Project human resource research student and graduates involvemy :
-: researchers involved in the project :
Race € african€ colour | India € oth | toak
Students involved in the project
- gender
-abovd age of 35
- youth
- disable
Total 100
1. Based on the technical progresses verified and expendire incurred on the approval milestone delivered entered into betwet the x,y,z it recommended that a subsequent claim amount of R200000000 ..invoice

...

-2.1.36,, 2. Project
project
R&D tax incentive : tshingombe outcome of the applicaty
DSI notifiy :
Tshingombe application for research and development the income tax act ,1962 (act no 58 of 1962.
Registration no : 2013 / 034490/07 advise application to be authorise
* Overview ,compagny
Linking compagy project
- annual progress report
- project submitted .

Science and innovation : research and dey ,Rd tax incentive notification of changes report :
- particulars of the compagny :
-namd of the compagy : tshingombe Tshitadi .
-name of the company : tshingombe Tshitadi engineering
- tax reference number € 9722328238
- tax years | 20|23

- project programmer or technological area name : engineering electrical
- 2029 application reference number .
- project programme technologie ..
- status effective date ..
Indicate change made project prorannd ..

- objective :: department of science science and innovaty socio economic development . programme administration technology innovation international coopy gov city power and St peace St peace college .

- methodology of research: purpose praticakbtheoreticJ science technology trade factor outcome table examination framework qualifications diploma emporewer phase subject
- country r,d activity will undertake : RSA ..
- other
B: discuss any incremtal change as selected above which o cured respected the research and develt activities of project programme technology area
- declaration by applicant ,,
...

- project :
Companies and intellectual property commission
Director training.
Data retention summary
- home ,my course , directors training, participants ,tshingt tshiday ..
Fist description : eny electrical St peace student CVS career recall project CVS property intellectuel design analyse investigation .discussion
Directors training : view user reports:
- user report tshingy overviy report
- grade item | calculated Commission | grade | range | percentage ||| feed to course total:
- module 1. 100% .
- module 7 -700
Sum course

-;cipic enquiry deregistered order compagny successful kindly that you comply processing..

- 2. Project
Engineering council Microsoft portal .com
Title : title :
Fiston :
- house unit .
- last name.
Ecsa communication ecsainfo@.co.za :
Dear tshingombe registering on the ecsa sa: 00125662 to be used ..
CRM: 0041309.
- subject : application form registration as candidate :
- compiler : approving officer , next review

Completion of for is necessary in order to accurately reflect disability statistt in term employement act 55, of 1998.
- candidate engineering.bsc .Eng b achdllor degree ..
- candidate Engineering technologist .
N diploma
- candidate certificated ent :
-candidate Engineering technician ,n diploma technical ...
- candidate special category.
Please include certify
-General information :
Name,title ,date birth ,identity country passport , employment
- examination passed :
- education institutions | qualification atteined | date of finaj examination officer recognise non recognise ..
King intiaj of commission oth justice peace control document management system
- declaration in the event of qualicafition not yet awarded ..
- certificates of competency : type of certificate , date of certificate ,certificate number
- I I'd hereby in application law declare to abide by provision of the Engineering professional act 200 act no 46 of 2009 and rules published the under include the code professional conduct
Item | description | yes ,no
- I have been removed from an office of trust on account improper conduct ,no
- has conviction of offence in RSA other offence committed priore to 27 April asdociaty with political and was sentence to imprisont with option find in the case of fraude to fine or imprisont or both ..
- never been convicted of an offences in foreign country and was sentenced to imprt without an option of find in the Cass to find or imprisonment or both
- that I have been disqualified from registration as result of any punismy imposed on me under act .
- declared rehabilitation insolvent whose insolvency was cause my negligence incompetence in performing work failing withing the scope of the category in respect which I m applying for registration .
- I am cognisant fact that should provision referred to above as depicted under section ,19(3)(a) of the act contrary council refuse my applit .

_____
Logged in as to tircog 009106 use type assessor
Seta
-adminiatration :
-user I'd : 127952
-acciunt activtie

- job apply form : purpose for job application merseta in candidate

advertising
-advertised Poste

Sasseta. Evaluation rec 2532 ,rec hr administrator . Weigth. Response
- 01 at what level is your human resource hr qualicafition.
- how many years of expert in performance in performing general humain resource duties.
- how many years of experience in coordinay meeting .minutes
- How can you rate your knowledge of the south Africa labour legislation on scale 1 to 5;
- how can you rate knowledge of hr information system that you are using or you used on a scale 1 to 5 .
- in not more than 599 words briefly dest your expert in the form of duties previuosle perormy by your self that are related to the vacancy .
- do you have a relative working for the sasseta .

- have you a relative working for the sasseta .
- have you been dismissed from employment .
- have you been suspended from your employment .
- applicant declaration :
Weight : 100
Submit
-;___&_____
- occupation motor registration occupation health :
- overview .
- initiative
-; qualicafition requirement electrical workers for different grade of electrical work .
- grade electrical work :
- grade applicant . Apprenticep ordinance in trade of electricak fitter or electricak craft certificate in electrical engineering issued by Hong Kong instute of vocationej education and Beeb electrical worker training council or equivalent ..grade,a,b,c,r ..
- grade a means electrical work on low voltage fixed installation 499a ,single phase ,b not eceded 2500a ,cc low voltage , r neon sign electrical generator facilitator.conection disconector to

...

-project :
 Eskom ..

Personality detail ..
-education :
- completed :
- qualification | institu | year quality | qualicafition rank | time taken

- professional registration .
- employment history
- company | position | salary range | outputs || archememt ,start date | end date | end date || employment rank |||| reason leaving

- college | panel wiring |
- college and city power | student | R 959.000.r 1000000.
- never been employed | education Engineering electrical R9500000..R 1100000..| ent electrical € #023/19/20

Eskom :
Overview compagny:
- compagny information :
- leadership
-sustanable development .
- CSI
-media room
- paia
-eskom
:photo gallery

*About electricity :
- electricity tips:
-electricity technologies
-eskom power series:
-renewable energy .
-fact ,figure
- visitor Center's
- Modi's fire alerts ..
*What we re doing : electricity generation .-new build .
- transmission development plan .
- ancillary services
- GCC report supply status .
- school of welding :
Eskom initiatives .
* IDM :
- integrated demand management
- energy advice
- Eskom : water heating programme
- measuremt .

* Career : vacancies ..
Customer care :
- C's online .
-tarrifs and charges
- mypd3
- customer service information :
Vs mobile .
- customy .
- tendered , purchasing police ,tender process wath out to tender supplier register insurance policies procedure beer certificate

Reg no 2002/15527/30..
*Zend.eskom drop .,I'd claim information

Never be employed
-eskom career ,programmer engineering in training ,technoly engineering electrical substation ,senior technician ,programme outage ,generation , draugthing electrical substation ,eny in training contrik and instruct configuration ,generation megawatt ,senior supervy technical ,Snr advisor application ,prof engineering quality supply ,national ,secretaire ,graduate commercial ,generation industry,humaine ,generation ,advert senior prof electricak eny,,officer security ,assistance security ,, megawatt regional ..technician in training ;

- email det@ Eskom
-applcant detail .
- first names .
- application surname :
- tshing .
- reg company name.
- compagy close corporation trust registration .
- vat registrs
- facility operation , contact representative detail ..
- primary generator detail .

Muñicipality will facility ..
- Eskom transmision
- Eskom distribution : network which facility will be connected .
Beast substation .
- city power .
- gross generating capacity of facility .Mw

* Net capacity of facilities me.
-the value must a number

- generating technologie:500000
- maximum export capacity me: 50000
-:electricity supply agreement - key customers
-electricity agreement - load customer .
- electricity agreement - municipality
- wheeling agreement.
- self building agreement
-demand response agreement
-cricak park price agreement
- sseg supplemental agreement
-sseg offset .bNkin agreement.
- ipp agreement.
+ Energy generat programme.
- energy effiy performance contract .
- peak clipping performance contract ..
* Gauteng based on the provincial indicate the province project will operate in ..
- GPS co ordinates ,indicate coordinator for on site generator connection point use wGs 84 datum coordinates dd° mmss,s" degree ,on site generator connecty rules to capture GPS Cordy ,do not enter a space between each number or letter ,aways indicate or letter ,keep the ,"s" or "E" at the end second (") separed the dehy minute and second as ..
23°52',0",s ,,27°,#0',46" ,E ,,as
Enter GPS latitude : 23,51,0
Enter GPS longity,#9, 23, ..location of facility :
- line @: street name ,line shbur,city
- part : contract parameter contract ,500000

-* city power is rest for provit electrical service to properly owner in the city jhb that are not served by Eskom city power customer check exist invoice ..

- service connection we provide are divided into categories namely small power user spu and larger powers small user is defined as user who has an electrical service service connection no greater than 56 KVA (3 phase ,80 ampere ,in general most general most household would have this type of service connection a large power user is defined as user who has electricak service connection large than 56 KVA in general these type of connection are used for medium and large commercial or indusy consume as well developed
- convert a spu from postpaid to pre paid .
- for new prepaid or postpaid spu connection .cover application ,sale city power jhb ..

-microsoft recruitment senior security technical p

- team platform, principle software engineer, seniors machine learning Engineering,position , facilitator ford cyber data analyse
...

- Project : ucpd / college and university distance nated internal external ,St peace distance granted saqa institut foreign record dhet .
- background : research development circulum in trade diploma certificate award meetbrequit and not meet national curry subject pass and regulat irregylrave school student impleny registration .
1.1 institut private implementating development award ruling .
-2. Background : imply review nated an examp mark capacity learner ..permissibility extension ..
-3 travel.
-4
-. National vocational exempt module theory praticajb..
- proposed value award process elibility
- research support.name ,first name ,full name ,..record ...
..**_____

TVET forum network ,skill work life
UNESCO - unevoc ,internal centre for technical education and

 ,knowledge ,connect ,with global TVET community ,virtual conference ,m
About manage account ,
TVET forum user profile : tshitadi fiston
-unevoc centre #3043
- contact : tshingombe@gmail.com
User message
- 2024-09-23: engineering qualicafition framework implentation TVET college Rd Congo record system Eni n studies lecture.
- experimental work TVET and institut backlog dhet ucp record St peace and Sita and examination model ..
- engini qualicafition framework imply TVET RDC and record system engineering n studies ..
- experimental workbase TVET and institut back log dhet ucpd record St peace and Sita examination irregulaty implementating.
- experimental career TVET college instut assesment police backlog Sita irregularite ,ucpd engineering studies diploma certificate
-2023-05-26 Engineering electrical career
Job workplace office place engineering outcome trade engineering outcom education tech ingenieure work partenship visited meeting engineering

innovy college job functy to goverment industrial function job ..
- engineering electrical implentation time to job time compagny experiemental trade.
- reseat and project circular assessment
-college compagy education career outcome Portofilio evidence low pratice assest ent electrical , student ..
- examine session day conference meeting cafe topics day presents study goverment career .
- research college Engineering career join compagy department implemt time table framewoy college to company electrical y low.

- UNESCO - unevoc international ,TVET used digital tools , micro credenty reskilk ,upskikk existing labour force meet future demand how TVET more flexii into learning models sacrit without models quality and wath role different stake hold such learning ,4.0 instrument

_____

- project:
Atlantic international university
Dear tshingombe certificate is ready ..
Presenter : lynet Davidson
- class taken : from idea to reality : a compret guide to setting up your own company .
-Topics : target ,audiancd ,business plan ,funding ..
- subject : legal studies ,E- commerce ,business management
Presentatt title :
Date recorded : 13/10/2023.
Material links :
- communication method :
- description: introduction reseat your target audience business types creating a business plan funding your business conclut and ,Q&..
- earn credit from live classes :
- attending a AIU lecture or Liv's class ear. Academic while forstering intellet curiosity and growth in a wide range of fields the class you register for added as tentative course class or self study research reading reflection and application of concept skill learner are encouy to earn ,0,25 credit can earned by answey a quiz quesy hploat academic work or evidence demonstrating the application of the concepts learner..
- credit value :
- complete class ,self study component .
*2 .

Present ,Jay bChahallt Radhakrishnan vijayasimha..
-Class taken : freelancing for beginners - part three .
-topicz and description : entreneurship ,hustle ,freelancing platforms ,Fiverr ,gig system of wori features

- subject : entrepreneurship , human development ,business administration.
- present title :
- date record : 12/10/2023

Class taken ; Montessori beyond the materials :
Topics : Montessori materials the Montessori methods ,pedagogy state of mind way of life
- subject : educi ,child devet,Montessori philosophy,early childhood educatt .

.:
*Certificate of participation: this certificate is proudly presented to : tshingombe Tshitadi : for participating in the class : introduction to geotechnical engineering ..through the duraty of the live classes sessit celebrated on 11- 2023 participant demonstrate a commitment to learn after class activite we congraty you for participating wish continue..

...

...

-project

internet archive ,price
- archive org . uploaded ,books ,videu audio,,p radio transcript volunter

upload : post ,review,collection
-media typre : text 27, software 2 ,data 1,
-Years:2023 22, 22 ,8
- topics and subjects: Engineering 3, Engineering electrical 3, eny nated 1, award ruling Ccma tshingombe ,career labour ,
* Collection :

- community 27,, community collection 16, community software ,
- creator :
Tshingombe 18,,20,,Ccma 1, Education Portofilio @, engineering tshingombe Portofilio ,expose science

,,,title description ,book ,
Release statement and finalize award diploma irregt Cass .
- the internet archive team ,internet archive , to me
support@archivdsupport.zsndesj.cc request (113521) reply to this email

The internet archive team (internet archive)
-its dispiriting to see that even after being made aware of the breach 2 weeks ago,I has still not done due diligence of rotating many of the API key were exposed in their gitlab secrets .
- as demonstrated by this messy the include Zendesk token with permit to access 800k+ support ticket sent to info@archivr .org since 2018..wether you were trying to ask a general question or requesting the removal of your site from the Wayback .machine your data is now in the hands of some random guy .if not met it be some one else
...

- 27 Jun 27,12:22 dear archive patron patron,a review was recently written for your item ,https//archive.org/ d'etat/2lettee .self assessment incidey we through you migty apprecit knowing this want ..click internet ,,

- project electronics support team elektor EN0292272UD dear rouwer customer suppt internaty media ,project .my lab store comment my project .letter experiemental job , requirements ,technolt dradt project ..

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- Google database Google account 9/17/2024 engineering electrical database system
- Google wallet ,profile training Google ,learn machine ,,on line issue ID:3388000000022260070....
Google excell ,Google
ICT Syco academic
Cloud Google education
Assessessment Google academic Coursera :

Alison: project

Graduate certificate profile
I'd : 31136901:
- courses in progress .
- diploma in ms project for civil engineering 94% ..
- security guard ,CCTV monitoring 92% .
-diploma in electrical teci ,
- electrical engineering in theory .
- ISO 37301:202@ principle of compliance
- the basic of security guard work.
-introduction body y training.
- advanced diploma in basic guard
- diploma in solar energy engineering.
- diploma in electrical studies .
- vriare vSphere .
Explore course certificate earn diploma earn a diploma .
- resume builder ,career readiness aptitude test ,workplace personality employment.
- Alison graded..profile ..
- self selected view .
- ----------
Certificate in job assessessment cpd

Learn | careers • earnings

- over 30 days achievement learning .
- 2h - 18 Mon total time..
- course complete %
-;course completed 0
- course in progress ##
*LMS | 6 month : assignment ,self enrolement select view managemnyy certificate | total certificate ,account total assignment yet : ..
- team certificate .
- balce of certificate ..

Report ::

Learn :
Module : outcome description certificate ..topics ..
1 topics
2. Topics
- 3 topics module

-----+------
Master cpd   jocob ..

...

-9 Project :
- dhet ,saqa ,qcto,scope teach learner
- teach and learning plan 2020 / 2025 lecture dhet an St peace college internal external external learner,Sita back log umalusi , printed NN diplomat ncv. Portofilio textbook
 Learner : name tshingombe
- lecture prof . Student name
- facilitator name :
- moderator .
- assessor:
- re mark :
* Part 1 framewoy and conceptual underpinning of plan .
1.planning examination trade examination term and semmester in college framework module circular assesst evaluation test 1,2 exercise book learning faculties diploma vocational coverage time time table allocation ent electrical and engineer college peer assessmy self assesst and group assignment sub completed in college and instutt police Eni institut quality implementation n diploma NQF 7,8,9 master degree diploma saqa framework wualificat activites and council trade test pratical ..
- problem based institutes ent and institut police evidence ..
- coverage eny police traffic police engineering subject lecture teach and learner ..
2 .aim of plan : vision college and missit college and institutes examniatt subject :
Basic advanced research and filling enginering mission planning school disciplinary area circult assessment police department .input output policy orientation guideline learner college must design eny analyse discovery job vision dhet examination policy ,and saqa policy meet criteria examination planning circular ..

3. Objective the plant : the exams national trade department and internal external examiner assignment objectivity learner to qualify and learner the end of examination should be able to correct to different ways of Engineering electrical . Conceptual underpt of plan .lecture and learner planning course class model design module and week completed ..
Master degree bachelors integrity in framework qualification must resolve solutions studies in industries
4:.underpinning philosophy for delivery of quality teaches on learning in TVET in TVET college teaching : report self and assessment ,St peace college external term was 3 month qualify engineering studies business diplomat internal diplomat was record report certificate years completed scale internal test class work homework record years assessment and peer

assessment critical objectivity learner delivery lecture annuej report principal and record at examination external ,statemt of result for registration framework or irregularity learner report theory and praticaj for diploma studentb ent 1,2,3 ,5 years lecture basic and advance field professional doctoral senior staff lecture learn work textbook and electrical subject , college college policy guidelines for Poe's work years memorendum exam ..
5. Key delivery area : in the plan statement and certificate coverage compare marks years college and instutt and test class work 40% ,60 % exam statement criteria plan module 3 month Engineering subject research ..
7 the embedness of the teaching and learning plan in college strategy . And institut focused examine evaluation was undercover lecture weekend and learner weekend ..
- 8 implentation and monitoring of the the teaching and leart plan topics trade ent national work research assessessment completed years : methodology criteria research textbook learner .
Time table orientation principal circular assessement evaluay design Eni facut ent time learner policing and college operational time periods movement time morning to afternoon daily move job circular years design development system subject Eni electrical and information no business to national subject reports orientation ..
- 10 addendum not completed response :
College st peace college and institutes Afric police ,completed .framework qualicafition design and NN diploma combination job in lecture trainer facilitator asses in order
- section / output planned activity|| report|| mesureare ||| target dates completed

-
- plane output | activities || verification minimy |||• evidence |||| responsible office design |||| output completed ||||| activities output no completed ..

2 purpose : qcto occupational qualification skill programmed development report qualification final meeting
1. Trade test qcto :
1. Trade mark holder property :
St peace college workshop class works licensed electrician assesst apprenticeship passing assessment category licence electrician theory let ,licensed electrician pratice Leo ,
- purpose of course daily course tendered provider service require trade skill report phase 1,2,3. Trade test readiness close report weekend attandat ..
Module code objective criteria :
-;4 purpose and cope ,saqa framework quality ,statement submitted

statement of work experience I'd transcript meeting 71638 primary status registration saqa assessment 0912 saqa institu ,30-39 assessessment policy ,IE099-IE00 regulatt internal saqa decission advanced intermedy phase teach agreement . Assessor ..seta edpseta

Engineering electrical assessing log exper in assessment exam qualification

- quest/ answer where appropriate applying lubrification correctly to assembly in accordance with specification and standard operational procedure :
Requirements where appropriate applying packing material in accordance with specification stand operationel pricedur assembly conformance where appropriate returning final assemblies maintenance record locating diagnosty ..
- how apply for job research hiring trade
- essential advanced

nated advanced basic essential nated to qualified workshop to wuali lab workshop school experience time table council subject report ready resumed submitted job reasoning : basic advanced inspect check variable Pleats understand quality experience trade .manufacture inspection ,pulling random check product gain verify packing required shipper packing check point dimensions shopper check measure chipper gross value measure cartoon gross , and
- purpose : completed time table implentation coverage Summative regularity ,
- 6 circulum value add asset is not subject to changed ,saqa engineering reasoning vs council vs ncv level electrical insfracture dhet principal theory pratical vs NC's matric teach learn assessment : research theory advanced vs basic advance subject design criticsj dhet resistance paralleled and series start delta advanced db system vs db board physical chemical memorise machine stationary vs transit machine in marking question papper irregularite progress, evaluation saqa low vs research low degree technologies field ,test trade vs framework saqa ,,saqa vs work experience city power Eskom job in challenge framework occupational reason cpd
- 6.1 assessment coverage dhet saqa council :
- subjects : project assessment and career mentoring research coverage faculty completed module : project bridge stable construction key ,bridge education . Advanced essential

-Purpose dhet, education input output :
Subject mining examination safety health labour mining police outcome mining examination national trade explosion mine : discrimination

mine ,trade AC ,DC mine machinery
- purpose national trade career : bridge static stability bridge movement phase period frequence stable way phase to phase job Engineering : lecture transitoire psychomotor job analyse functionalite rate class hr building task tools must up date collective function real world student function machine rule input output the class function rules teacher created spread gradient a vector functiy gradient if scalar f (X,y(arrange parthy stability construction isostatique diagram force force structure hyperstariv beam regulatt commissaire tools form stable trade nated eny subject assessment task build mark allocation ,content average tools points balance framework structure stabilt .
- instability system development bridge statemy periodic 3 month way key learner break time semmester maintained up grade up ..
- teaching plan daily underplaning g phase intermediate foundation senior cadet minim. Staff lecture. Time table general linearized x(t) control didactic process machine key learner input out putvlooo variable subject X,y = y(s(X) discretion signal temp instant energy power time R+# ,jx
- transformer Fourier control didactic time table xt,r+# DT ,counter measure frequence content sum property X(A)+ property lineare time table input,real time table ,derivation note time table dx = St,TF(St) integra impulsion direct time table uniform impulsion retenty xt expent time table complexity time table loop ,transfory Fourier TD (X,y) filtre lineare box lineare circuit transfer input (s),X(t) ,
- regime yransitaore learner phase and teach system linear u (t) system education stable sponement statusfy eauilit means system input loop Kirchoff constant transmisst , signal course module week course type trade phase test readiness .
- test scale maps distance leart corresponding learner concept distance learning scaling generating learner scale weigth learner grade real m square factor point accuracy measure degree ,
- geodesie projection cartographic board cayane ,isometric learn plan circulum ,latitude circulum implentation perimeter circulum schema seauet projectuy constant projection coordination examinatt circuit dhet ,

- low rules conservatt vibration force input ,low rules of conservation of energy learner circult policy engineering move mechanical kinematy energy done step education potential input teacher ,Kei+pei=kef+PEF ,,step phenome efficiency useful work total energy input transform active dev learner frequence capacity displaced resonance frequency learner materit curie Piezo electric voltage
- dhet vs seta merseta sasseta training accreditation
- purposd manufacture theory pratical component equipment trade to. Max ,chain diameter ,trade. Code objective criteria for ..
- dhet vs seta merseta sasseta vs saqa :
Purpose defense civil military safety outcome assessessment ,manufacture relate theory pratice ,engineering : learning purpose STD fuse holder

ligthning arrester electrotastic device functionality marking ,mil terminal identification document identify togey functional load charge ...
EIC sans sabs
- dhet qcoti saqa sasseta : outcome module engineering science module completed algebraic blinaire basic advance system learning

- eny science theory theorem fundamental reseat step task lesson plan lecture plan mailing investigate analyse input subject module assessment : orthographic othopedagogic ,educare function subject term trade theory marks score insoectuon police in entort low pedagogie fundamental..framework engineering compliance crime ,,test score subject Engineering trade value evidence ,los

- purpose dhet national trade engineering electrical fundamental engineering levej and license trade eny professional council :
Compare test methode two motion low machine systemeaneare evidence..
- purpose wiring way premise network network line fuse commutation : network
- dhet vs saqa qcto pratical work expert lab workshop workplace industrial comput trade .
- purpose machine manufact :..
- dhet ncv nated lecture vs saqa subject electrical principle and pratice NQF level ,2,7;: coverage field
- purpose instrument measure trade , engineering electrical measure control : trade theory manufacture and learning rules instrument measure connection ,learner assessment,contrik task ,control assignment control learner assessment didactic control objective education rules ..
- dhet vs saqa vs council trade nated occupation,
Purpose ,education Engineering and lecture .
- council psychotechnic test ,psychometric ,test questy ,39 pass ,100% of numeric and alphanumeric eny job trade job nation ,intelliy test iq ,test of administration ,capacitive how to pass psychotechnic tips for approach ,psychometric , assessment intelliy altitut personnel test recruity career young Engineering mental afec class operator ,quotient intellectual intellectual age nated vs saqa dhet learner intelligence quotient iA equation MA/CA=IA,,
- ma is mental age c chronological age measure of intelliy ,lesson transcript ,IQ= MC/ c × 100 merute age ,80<1A<140 intro phenomelogg educare master kid child degree nated
- potential increase cognitive load low mrssicks ..framework ..
- quality of lecture : person correlation Q1/A2/Q3
- followt scale c meaning not at all Cass meaning ,
@ the topics / topics covered in lecture inand learned
- lecture covered formulae perceived as very :
- the lecture covered and definty.
- instructy and explanation .

- activity really understand knowledge
Ent engineering lecture topic instruction activities offered means didactic ..
- purpose : education learner : eny physic science coverage
-;purpose : dhet seta sasseta skills NQF levej credit ,7 programme management electronics security psira grade assessment threat for security installation v
- orientation ..topic ..
- purpose : student informay system student management system have revolution the education landscape teacher and student with a cost effective and efficient platform interactive collaborate and keep up with academic assignment student information : using technology management student data kwitcj teach find better contrik store track informaty communication award of assignment date in class activities ,increase effit of teacher classroom day day create process ,improve overall of teach implantation view ,record ,provide depper insigtg ,save cost large student papper work ,sortthougg duplicate reduce efford training testing requirements .
- role managent information system in education organise compare bkokf ,information such data activitie valuable educarirvto efficiently manage their.
Important moderne era technology tool ,institut Safeway make ,all decissy quicker along completed ,
Admission inquired management. Strength of sture. Realt time student record information such grade attandat discipline assement score ,access to lesson .

...

- project
framework. High education n high education
- register saqa admni ,national framework regulatory qualification instituts ..
- award diplomat work day certificate 1th,2th,3th,4th level..
I'd number submitted record ,academic transcry learner student lecture n national certt diploma credit equivalent entry evidence explain ,50 equivalent.
- name surname credit accreditation minimum ..

_____
-id| name | years qualification ||| provision |||| file student ||||| submitted document file |||| course attandance ||||||| exam attended ..

_____
- total entry move performance sum ..

_____
- move file submission student term 1,2,3,5,6 semester periodic record | 3

_____
 month entry 2 week lecture move .
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Subject file student || subject ||| term ||| years ||| score ||| score |||| final marks ||||| final point |||| final submit ||||| final ATT ||||| final exam
--
.1 register narionsj framework qualification ,n diploma
I'd| name || years |||| file students ||||| submitted documents files ||||| course attandat ||||||• exam attended ..

-:I'd number | class level || file number ||| submitted number ||||| documents attached |||| course attandance ||| exam attended ..

- I'd number candidate irregularite register ..
- test circuit ..test ..
Homework class work exercise book research online Poe | capacity to make reproduct analyse written €|| criteria minimy requirements ..| criteria minimum

- test evaluation module topics research Poe's | functional school a addmic task system function ..
- examination evaluation diagnostic module external internal | low competency years term weekey rating period achieve
- check procedure check caliby operational explanation material conduct low,resistivity
- entry assessement credit module completion value
- outcom exhibition assessment process control technologie.instrument method measure screening outcome compulsory component Engineering electrical subject meet award ..
- operational task module entry criteria award transcript kperationaj
- engineering science static analyse specific load load expedimey control kinematic level doped velocity velocity distance test odometer calibration bank test panel car power test strength momentum test turning dynamoyric key fulcrum pulled test test rather electricity low test electro test electro heated calorimeter test specific test break energy kinetic friction Min ,max load

- value | force || tr/Min ||| n / Min |||| calorim ||||| kWh |||| power |||| torq ||| degree..
- test semi conductor diode rectifier full help ligth photo foo test value current peak test evaluaty characteristics specific , soldering , capacitor

active passive elemet manufactory test criteria test transistt phototransistor circuit value value load efficiency thyristor disc triac silicon integration circuit operationej test amperage voltage bias Kirchoff low step detectit transducy motor DC AC magnety measure oscilloscy digital PC test value alternative ,regulatory logic diagram register process electronic key ..
|Test value nominal || A|V|||W||||kWh ||| kvarh
- unity
Vco / ico ,rco
Circuit loop
Diode transistor
Test circuit loop
- power machine year steam machine compressor heater test .tr/ Min

Value | algebraic | trigonometric | mensuration .
- working line support and fault analyse in laboratory pratical general electronic embedded systems hard software knowlogdge capture PCB manufacture technical , meter care ohmmeter calibration check material checking ,insulator resistor check field magnetic flux meter ligth
- unity design calibration |a|v|w|kWh|cos|ohm |

- error means

- 2 tools assesst mark check system fundamental assignment : trade theory electrical switch contrik test way contrik insulation average installatt way minimum value RMS nominal maximum circuit breaker way relay time cost installation materiak trade lower Min eqyilibt circuit line transform value trade load ac current value ,compliance..
- test value | A| V||| W||| kWh ||| kvar || cos
-:nominal
Minim
Max
RM
Avg
Unity
Cable
Bulb

Tools assessment mark mark check : control system control logic. ,voltage ,amperemetr ,watermetr ,voltmee,etalon kWh statement of work experience ,program code , electrical saqa qualification is n diploma ..
- module criteria n diploma test job work measure compare ..view undertake n diploma assembly inspection in national trade agreement verification occupation instrument methode measure check conformitted meeting ,module value experimental qualify meet mean meeting assessment mark remarking ..store room rwiten :

-;installation circuit up 1009 v AC preparing work accordance operationel procedure and hazard and safety requirements operating procedure work using instrument measure process selection ..cabling installation ,wire system and enclose support system marking labalked testing completing and document shortly ,,Tagg testing checking modified .
- entering routine information vPro forma repaired control look evidence confirm ,check operationej contrik device signals obtains ..control operation report response , engineering dismantle disamling servicabt item ,setting ,test skill dream statutory electrical wiring support and protection requirements terminal .manufacture conductor ,select transmission finaj contrikb
Component : very satisfactory performance , fairly , band minimum

____
- test operational ac ,DC motor AC ,DC generated method , verification transformation test insulation auto transformation test ,measure transform measure power factor transformation start delta measure relay current ,rating ,AC ,DC motor test insulart characteristics power torque relieve machine contrik ..cooling
Board panel
- test| A||V|||W||||KWH||||KVARH ||| cos ||| torq ||| c
- nominK
Max
Circuit
Unity
AC
DC
Current
Relais
Contact
Generator

Week daily ,, month criteria qualification asssess meter : value 100 mark award license component ,, material didactic tools

_____
- test operational transmission overall load system transmission generation plant power test insulation test safety security inspection circuit breaker circuit gear ,inspection transmission insulator network test radish distance

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- test | A| V | w | kW | kWh | kvarh
- value
Nom
Max power factor
Allowed
Rate line
Feeder unity

- transfo
- generator
- distributor

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- Engineering drawings : orthographie project ion construct .view .
- test dream project reproject reciprocation tools rules test scenarios

_____
Total inspector marked chief qualification
- 1. resource humain learner certificate statement irregularite students total students finalize matter teacher department high educated statmey and department basic educat certificate resource humain intellectual property published.student leavers school number scaling training development vocational unachievable bsubject time table attendant registration private instituts private . Inspection non achieved register marker non report marked technical ..
-;1.2.problem sector ent systeb information over Lk day leaver class statement certificate number disqualified integrity development support register unregist learner and teaching resource support problem zone space land school technical ..
- 1.2.4: abstract : school learner Academy leaved school schedule policy. Criteria coverage certificate diplomat retentt dissemit distribution system informat recruitment resolved problem engineering system information about your campagt market circular assessement completed not we have been average subject ..
- 1.3 hypothy : overviewlow phenomen on subject education technology and education technician educated career low elementary fundamental system basic low trading school ,advanced academic statemt vocational education technolt education technician career trade intermediary process power fabric seniors fabric time table examination work permit conduct school academic and inspectorate time permit peocessi no permit over date day discoss irregut time table low care mentioned no results success coming overview system information framework regulatory unreported print out system process rector at director external internal control task assessement registered demonstration low time table refundable policy in resolve conflict in time register no answer examination disqualified structure irregy low rules examination evaluation evaluat low opposite subject ,model didactique school certificate..
- 1.4: acknowledge : synthesis statement certificate award marker leaver school lecture marker inspector remarks result record archived performance movement flip filing outcome online weekend engineering elt no retrieved time challey system .
- 1.5.analysis students fee support school years term weekey no grantees goverment asking heo for additional time framework regulatory system school value total ..
- 1.6 .synthesy on no record registered in time period valid stamdntv noted

irret space private phenomenon damage space result cotestarariib diploma certificate learner learner and lecture result at report
authorities ,qualification and council parlemt motion agreemt career job workplace .rehabilt counsellor supplemtaire subject line picture on line student divulgaruin register trademarks reason eliminate irreguy schools reasoning communication new framework regulatory school minister .P
 Project experimental aware system and back log Sita no qualification additional

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- purpose : planning structure multisector academic : case studies and council educated and educated
- 2.1: purpose operationel step : operational working reseat abstral : 2.2'knowlwde working verification : management subject doing irregy instructor career outcome daily teacher developm system time flow sheet time table inspection .
Inspection academic master advanced existing essential base trade system operationel system for progressive mark NN diploma continue developing existing support ,,authority office operationel

Finalize time : final score :
- research abstral purposaj ;
No meeting finaj award and irregularite ,,
-:externK internJ year exam preparatory test levejv...
1 term | 2 term | 3 term semest|®years | certificate | scaling |

- module | scaling module 100 mark | 400 mark | subject learner
- finalize research advanced ,time table lesson planning ,

- calculate planning | month years attandance ||| register course || semmester ||| submitted course |€€€ student learn exam ,score finaj ....

-* purpose principle schematuc qualify:
Generation induction learner examinationvalue machine learning transmisst assessment
 Generation learner skill admit information stock database Engineering processing.regeneration machine learnt alternancs continue submitted submitted periodic score finalize resonance learner general ..
- group learner port serial learner lecture parallel resonance oscillay learner compensation learner factor power efficiency learner contact finalize retransmission examination
-;purposord exam assesmt centre workplace power supply meter square research : room sar metr power ..panel research contrik task assignment asst manufacture meter square panel year examination .didactic material for

lesson plan exam reseaexg control office I'd
- engi electrical civil building test examination criteria criteria screev ,panej trade theory electrical supposed tools assignmy to trade for irregularite manufacture pandj ..
- engineering case study : tools class ent electrical assessement and workshy ..question answer completed ,circuit outcome research.
.-2.3 pratical module question : textbook scaling analyy investigation engineering ,dimenst project cost exam..experience career component panel wirklab installation : switch way research advanced field credit core pratice generated induction learner accumulation learner resonate to control switt contact information room examined panej room exam switch break circuit way switch way trade theory buyer sake salee room oaneh switch learner way contrik remote examined panej room exam switch breaker circuit way trade theory buyer class room oaneh switch learner way contrik remote learner generation g,1,2 switch connector learner mingtg factor switch two way communication going field class room in our stair contrik switch way external via internal room manufacture sautchbfir contact switch
Room manufacture sautchbfir contactirvrelay delay switch contrik communication design systet key learner making instrumental correct measure learner value current assigmmt current oressii. Value resistance learning eny triaj class room installatt current power class office examination invigilator low . experimental panel wiring for develop system was short material for trade safety industrial to experiment way generation inducty motor give on exam papers module skill.sizs efficiency fundamental elementairg creation manufacture panel nd tool need manufacture
- purpose advantage : Engineering research trade in panel wiring police assessment experimental switch class room instakk power factor maxit demand energy .generation average instance AC ,DC
- purpose disadvantages: ent research trade in panel wiring skill : policy implementating regulation theortb remanufacture ..
Reasoning ..vs
- purpose requirements : to qualicafition trade best application :
- test orthopedagogi

Foreign institutions < foreign institut @ saqa .. two day response unless futhure research and or consultation required .
Reference number : 006594..
- name tshingombe
- country : RSA
- purpose : check status before applying
- email tshingombe ..
- institut saqa submisst number : 20220785055 tshingyb tshitadi .
- *overview : qualicafition history purpose resulted in line access new application name of qualification. Award by instituts the qualififacaty was completed award by country form general employement future study high

education universyb undergraduate ,post graduate applicaty estimated no 20220715014 qualicafition holder tshingombe Tshitadi application
- foreign institut inquired policy criteria outcome assesment award meeting section 29 (a) March 2027 saqa application tshingybfisrin does not met our requirements band is being returned explanatory letter refunded saqa dear #9(a) of the criteria for evaluation foreign quality withing the south African NQF as amended March 2017 stipulation the requiremy that a foreign awarding instityutiinn must meet for it qualification to recognised saqa base the bassv..on linrv application document stipulated followit in terms of schooliy qualification saqa accept only school leaving qualicafition issued by the official examine certification body in country of original and not by the school where based on external examination .
- no certificate evaluaty will be issued for school leaving than those in respect of completed national school existing quality issue by the relevant authy.
- therefore.only school leaving quality correctly awarded by the authorised natuonsj examination booklet ii the democratic Republic of Congo will be recogny and not school leaving documents issue by the schools it self note the purpose of this oversea institut emaikf to give saqa foreign qualifications b.
- we receive your application for the evaluation of your foreign qualicafition and will revert to you as soon posst your ref number or futhutev
Saqa is going transitional period which has resulted in some delay in processing foreign ..as well responses to telephone social media we are best exoedity do not resend your application unless saqa request email courier dupplicarionb,additional documybrequest .do no use for any else otherwise it will ignored ..

...

- project
- formal technical College instruction programmes 191 ,, n1-n3. - n4- 6
- assessment task continued ,
- subject : trimester 46-49 lecture days natureh ,week 2-4 test ,,week 5-8 test 2 ,totaj test 2
- subjects 75-78 lecturing days .term : test or assignment ,
- term 2 ,1 test or assignment internal examination .
Total term 1 test ,assignment exam
- not yet competence level,5-6 competent = competency ,6-8 = highly competent ,9-10 excellent competency ..
- level of competency : mark allocation ,4 excellent | high competency ,not yet competent

- subject and level : lecture ..
- task :
- subject aim / learning objectives numbering only :
- question ., format type short response | medium response ,extended .marks cognitive ..medium response ,short explanation description requirements couple of sentences.
- extend respond response long explanation description description
- Pre - assessment moderation process .
- ref lecture response for setting test assementb .
- Pre assessment moderation process and timelines ..
- process. | Responsibilt | time line ..

Subject leavek Rachel assesment :
Exam moderation
Hod senior
Trimester class
- managing of due date on the subject committe assessment plan .
- technical criteria ,
- content coverage
Moderator completed ..
- implet changed as recommended by subject examiner internal plan after feedback .
- finaj alprovsj of assessment instrument print
- mark script selected for moderation should best
- moderator should
- subject ..
- keep moderation process subject
- re marking variance
- award marking for correct answer ...- error in the adding marked made ,check total all scriotv..
- marker hand assessment 60/10= 69/% =™, capture marks it completed lecture red pen

_____
- criteria | examination | moderator
- name of subject ,task lecture and moderator is ..
- subject aim / learning objectives are listed .
- conceptual levej indicated per question along
- criteria technical task yrs or not
Cover page of subject time allocation mark allocation
- instruction are clearly specified
- layout is reader friendly .
- question papper assessment task have the correct
- marks allocatt are ..
-:formula sheet ,answer sheet ,address
- quality of illustration completed task .
The task is cost..wehhity spread of content learning objectt covers

- cognitivity skill
The are is Ppropriate distribution in term cognitivity level bloom
- taxonomy any that
- choice questt are of an eauaj of difficult ..
-there is appropriate distribuy of marks learning objectyv..
- there is in type task is according to the requirement of subject syllabus .
- the type of task is authenty to the content being assessed .
- there is a correlation betweg mark allocation difficult..
- subject terminology is used correctly:
-:the language is approprit and unambiguous for the levek of candidate .
- the task does not have evidence of bias in term of gender issue race culture and provincial .the task in line the relevant current policy docuy .
- assessment tool ..
-;cover allocation mark .task tools is appropriate for type asssssmevtv,forhak check break spacing ...
- mark allocatt correspond with marks on the assessment .
-:draw clear and completed..
- ...criteria :
Studeg were note advantage,distavsntageveither auestiihb
-:alternative anawe have been accommodated where relieved applicable .
- all responses have been assedevand allocated assessment tools .
- the marks for particular Tash have been totajed correctly.
- the totah mark achieved for particular task havevbeefv
Weights b
- lecture was constitute assessessment information I'd qualification sacsvregistratuuh experience work Appointed duttb
- file contain
-:,content page
-:subject syllabus
- subject work schedule ,work plan ,pace here .
-:lesson plan and teaching resource .
- evidence of additional support task as require college academic policy.
-:evidence of additional support task as required by college .
-:evidence of review ,diagnostic and statiscak analyse ,including notes on improvement of the task for future use .
- previous question papper ,revision exercise ,addition exercise , homework activity worksheet ,tutoriaj..
Minute of subject meeting
+ Are the document in the file date reustev, assessment schedule bcontentv instrumehtvtools test assignment internal exam marking guidelines rubric ..
-:evidence of Pre - assessment moderation tasu .
- evidence post -:assement
- composite and Poste moderation report ..
- hod programmer manager
Totaj number students enrolled.
- total number of students asses

- totaj number of students who passed all assessment for period
-;icass iirregularity register
Exam cycle
- date | center n I'd offering | level | icass | mark | categories
- action take:
- trimester subject plan :
Subject
Assessessment task
- assement tools
- content
- duration
- lecture
- moderator :
- submission
- assessment date .

- completed date of post o
Posted
- test or assignm marking Meno rubric

Subject: years ...trimester ..icass mark | final mark
- icass trimester marksheet |™student | converter mark wigtg 30% 79
-;tasks | time frame |™types of assessment activity the duration proposed .allocation | scope of assessment |||| contribution to icass trimester mark ..
-:week €™test 39;-35 marks | syllabus content must |
- week 5-8 the duration ..
-:rubric for assessment preparation of function room :
Assessment criteria | level |
Task : stocking all stick reqyiremt attend .
-:application health hygiene and safety practices

- task setting function room
- efficiency time managetb

-task |™criteria | possible weigthv
-:..evaluation ..subject trade theory pass .duration
- irregularite: ...
-:periodic of validity icass policy..
- assessor require : etdp. seta if lecture conductingvv..integrity
-:typed of assessmtv: ..

.

...

-:project
- reasoning for irregularities no submitted or no filing dismissal reason methodev,
-:institut and college assessment exercise book .
- 1. Time 08:00 - 9|08:40-09:29-10-100:00/100/10:40-11:20/14:49.
2.weeek day award certificate course assessment guideline information guideline orientation research . Engineering ass , ass test trade exam / assess information Orientation Engineering exam |. Information information orientatt trade exam ent information orientation assessment ..3 week certificate science drawing engineering ,trade theory electrical industrial industrial
4. Week certificate ass school educare assessment nated test ..
Critical trade test time table Sita back log NN diploma combination

Record transcript institu buchellor master degree :
Total record design subject development ..

Time table design

Icass lecture master NQF

- designing model didactic :
- subject ,assessment task // mark allocation /// content average /// student programmed .
- electrical trade theory ekectrotechn electrotechnology ,mathematics ,ent science physic engineering science drawing ,assignment ,310,329,100 module allocation synthesis verificatt task sequet gov item 3 month ,6 month
- 1. Evidence low organisation supervisor planning :
1.2'low supervisor and management product labour educationej intellecty care low didactic low supervisor and management product la educational intellecty c..low engineering process business career natural low psychometric phenomenon deputy TVET markets motion policy framework regularity mandate irregut eny trade report ,low system development code kind Colum matric vertical value .
- low assessement Portofilio documents wallet flic floc timer compare electronics mail disclaim post communication ordering address policy security message posted officer system cloud protection document missing documy assessment address postal .
- low union police bargat Ccma binary information electrocompt onus

balance low test humain resource police inducty learner motor industry skill.
-;EIC low safety police security union trade theory electrical gov machinery labour license commissioner compliance installation EIC low safety commissy motion safety EIC sabs frameorh compliance low engineert from electrical rescission power and information intelligence b non compliant restrain trade database materiak hardware system in component electric cak delay ent system process development ..
- low recreation design communication system cloud policy information manat system licensed jurisdiction term regulatory 10142 size minimum ,10;,max Portofilio docket system build database relay gate home contrikbroon network ,low synchronisation asynchronous information library algebraic system motion rescission safety policy electrotech electrotechnology fundamental power archive engineering recreation trade union policy procedure labours missing fault dismissed scan criminal schedule b..
- police resolve crime information final administration learner registratt attandat ..
- low Poe evidence police operationel principles low command and control of land army assessment police operational detention enfirct compliance offence Patrik methode investigation criminsj interview low enforcement traffic control potentit cause determnit land record evidence collection item recommend framework verificatt subject industrial electronics modules electrotech ent science module allocation mathematics n1, n6
- system ent process managt low system process overview allocation design synthesis..
- integration cost and function allocation primary task define sequence function gov item planning cost work brakdy electronics system hardware softy data measure test support system header switch defense system .quality long life ..
- verificatt system engineering low to explanation power distribution system electrical noise communication system product element decission database input function ArcGIS dabass automate contrik verification blow evidence thermo electrical coding operating cooling performance vs current max vs DC pump power supply of the manufacture comparison of two tech control linear vs cooling system heating pump vs current conyrikked compare overall energy design process thermo electrical estimate integration interactive parameter power heated rejected vs current load power dissipation dq/ dt ..heated rejected vs current allocatt function sunthec system element alternative assessment technologie b..
- Poe evidence low mathematics rules term system nominisk binominiaj trinomiaj polynomial factoriss sign diffeentiaj lowvaddition substrate multiplication low exponential angle algebraic low limited low continuity reasoning low derivative function existing relation low identify trigonometric exist low of integration ..
- Poe evidence low physical Engineering low system international low symbot name unitblaw rate meter kilograms litre squares meter henrtv

- evidence low physical Engineering low system international low symbolevname factorisation log differential product low addition low substration loe divusiihb pascaj emperage ohm joukr voltage second ,square meter henrtv
- evidence low static kinematics dynamic reasoning low force required to accelerated .f = m.a reasoning angular velocity low moment of cylinder lowc strength materiakv magniturs gravityvfircd ,AC DC machine Serie existing commissioning EIC sans skikk development enfint outcome load torquerv..low explain motor ,evidence low.faculty development ...subject ,,stability master skill low degree note teacher time table outcom register total ..
-
...

- project :

evaluation saqa vocational framework qualicafition.
- Portofilio evidence low research assessment ndiplomat and master sdiploma honour graduate. , engineering and lecture engineering..
- technical and vocatt education and tray lecture learning work integrated learning : assessment in order ..
- - post : seniors lecture :
- contract : perment .
- salary R : R 353979 per annum plus benefits as applicable in the public service. ,private
- course working
- technical vocationally ,national trade ,national vocational Portofilio assement
..
- name of lecture :
- learning programme :
- subject :
- level
- class group
- name of lecturer .
- learning programme :
- subject :
- level :
- class group .
- lecture
Personality training financial

- learning management system acceptance factor technical and vocation education training colleges institut graduate
1. Higher EDT institution use dhet learning many system to support and enhance the teaching and learning process however teaching and leat process and learnit activities at technical and vocat education training institu different non tvef institution LMS papoer investigate why LMS use in TVET instituts discovery help ..
3.- LMS in teaching and learning TVET institution work licensed under the creative
-2 introduction teaching learning , integrated with learning activite it provide lecture the ability to generate distribute content evaluation progress history LMS web.
Technology teaching technical has dramatt .new teaching approach and pratice actively involved in creaty an information..
-technilogy has change learning styles and how people learn improve the quality of their education ..
- teaching and learn among students lecture claimed that LMS is ..
-4:learning manat system : development of education technology has online l made online learning popular around word distance learn web ..
Base course management system that allows student to retrieved learn materiak made avait lecture a web the system comprise basic contrujbleaeb information interchange..
- technologie base digitizatiob study show that using technoly ,factor investigate the factor high education. There some issue with the studur that have been done succes theiryr underpinning technology student success involve technical and non technical issues ..information system
- technology acceptance modej are use by research determine levdj if success produced by information system ,1989 Davis introduced the technology acceptance modej which state used measure success bass their estimated , development to evaluate user acceptance of information system has been tested with varying levej if experience systwh levejvof experience and modej individuy decider to accepted and information technology system described by their Behavioral goaj based in theory of awareness vuse fullness ..information system introduced success modej MC state that technology success ..
5. Discussion : LMS level system quality feature that able to attract students to use .based in findings .
- identify acceptance factor LMS ..base expert review ..

- project ..
The adoption of the e - Portofilio management system system in technical and vocational training corporation ,tvtc
- the giligthf technologies acceptance mode ..
- 1second order factors ,technology ,organization ,environment has signify and positive ..

- 2 electronics Portofilio management system ..need effective framework highlig unfluey positively affecting employer performance study factory of interaction technologht organizati modej proposes robust study used quantitat aloriacy in copies proposed question .statistt softway technology .quality training cloud computing ability governmy role big facility found ,43% of the variance ,,exijsv percentage..
- keyword ,
- introduction : outcome base development cooporat faculty learning . Outcome based ,refer to education ficuse planny general ..
- literature review :
Decission learning teaching create are based best ,
- constructs
- technological factor | construction
: perceived ease of use ,perceived usefulness ,system quality

- organizational factor:top management support financial support training ..
- environment factor : govrmet file cloud computing ability ,big data facility
- adoption , intention to adopt
- use epms : indivualuzattion
- demographic information , age ,get Der ,years of current job
: factor perceitivs ,
- question : the expected performance :
- overall perfot is sufficy ..
- data analysis : survey collected the were processed software alpha descriptyvd integrating using investigation conceptual modej measure hypotheses .
- reliability : science instrument well it perform condition valid instrument have been validated ...
- assessment of normality and common method bias : structuu equation it is necesy to ensure that data are normally distrt two aporichrv..measurementbdata were normally district skewness and kuetosis value dassr been affected by coming methodevusing instrument to evaluate all variables , single factor test helped..
- results .obtained result from the analysis are presented in this section .
- profile of demographic variables .
- total variance explained
- component € initial eigen value | extraction sum of squares losing . Totaj € % of variance €
- theoretical contributions : study and finds theoretiy and empiriy research . Developm ..
- praticaj contribution : general role performance
- limitation research : caution finding private indtution base evidence ..
- suggestion for future research .recommandev.
- conclusion,education contribution operationel adherence regulation b..
- model product testing in idustrie

_____&____
- 1. Watch this video on their of learning: .
2:the natural of knowledy and the implication teaching :
- scenario
- theory research .best pratical teaching .
- epistemolt and theories of learning :,epistemology ,theory learning .
- objectivism and behaviourismd : objective epistemolt objectivist approach to teaching .
- cognitivism : cognitiy learning ,constructivism approach ,
- connectivity : application connectivisn learning
- nature of knowledy changing .knowledge changing ,knowledge technology commodity ,academic versus applied ,relevance of academic knowledge society
- summary :
- methods of teaching campus's focused
- academic versus .relevance of academic knot in the knowledy .
Five perspective on teaching .
- the origins of the classroom model design ..
- transmissive lecture : learning by listening .
- definition ,origind lecture
- what does research about effectives of lecture
- does new technology make lecture digital age .
- why are lecture still the form educational delivery
- interactive lecture seminar and tutorials learning .
- the theoretical and research research basic for dialogue and discusst .
- seminars and tutorials .
- are seminars a pratical method in massive education system .
- learning doing experiential learning
- what is experiment learning .
- core design principles .
- experiemental design models .
- experientaj learning on line learning envirt .

- learning by doing apprenticep..importance apprenti as teaching modek .
- university apprenticeship .strength work ess
- learning by Beng the nurturing and social reform model teachings .
- the nurturing perpecti.
- the sociaj reform perspecty.
- past and future the relevance of nhrti and social reform .
- methods for connectivisn
- the files of learners and teachers .
- strength and weakny of these two apriacy

*Relating epistemolt learning theories Nd teaching methods ..
- scenario developing historiy thing .
- online learning teaching

- old wine in new bottles classroom type inline learning .
- lived streamed video .
- classes using lecture capture .
-- course using learning management system
- limitation of the classroom design model for on line learning ..
- the Addie model :
- online collaborative learning : core design principle of ocl ,community of inauirt ,developmeing meaningful online discussy ,culture and epistomoloy ,strength and weakness online collaborat learning ..
- competency based least :
Wath is competency based least ,who used competency based learning ,designing competency based least ,strength and weakness ..
- communities of lraft :
- theories behind communities of practice .
- wath are communities of practice .
- designing effective communities of practice criticaj factors for success .
- learning through communities of practice in digitsj age..
- scenario venture in learning ..

...

Project :
TVET lecture underplaning..Framework qualicafition nated ncv combination irregularity back log insurance assessment policy engineering studies Work experimental based regulation discovery Portofilio skill development rural energy low rules
1..1 introduction : framework experimental nated ncv combination Nated combination irregularity policy management system information workbase experimental facilities moderator personal trainer and lecture workbase conceptual in vocational instituts framework meeting discipline resolve continue insurance body framework system education challenge level disciplinary
1.2 .problem statement :
Implementating framework qualicafition system agreement statement over stay system education technologie and technical vocational engineering field in Engineering lecture and assessor conducted learner need to print in time outcome information and quickly statement ..of review marked and remarking
- purpose of study : research advanced field and research basic essential field system rurale need to implementating in new system. Energy of education technology era system council adoption low rules statement

college distance learning courses subject issue teacher design framework and work framework with learner job. Team ..
1.3 .2 rational : idea logic approach methodic disciplinary hearing duty system of institution vocational and system management system information need resolved , idee job fractinel evidence low design information management system instituts police no meeting equivalent national exam and statement of result research out mark druip reason additional information irregularity system need to make reason quotion of job learner lecture agreement of same compensation insurance for aware certificate compliance hr resource to recognise certain factor idee no to monopolies education system but democratic liberalism of certain factor in examination criterial of course private system industrial..
-1.5 background to the study :
Ireviewed and over view system agreement continue framework attandance rurale school college time table more less agreement system policy academic organisation of national trade faculty and national framework qualicafition system internal working base system need to quickly factor policy dhet cat council award challenge policy college academic with engineering system theory and combination factor need theory to be agreed with internal external factor meeting college labour ,learn college and vocational technical in challenge was slow to challenge factor learning and release resultat printed statement no remuneration outcome of Portofilio damage system information leave reason non accreditation no credible process ..
- 1.6 research question:
- need research in field advance essential basic assessment police topic project . Analyse investigation research over stationery police stations ..policy management council trade theory electrical engineering department university distance education technology agreement manufacture related .research information additional information system research printed orientation industrial ,research in academic police engineering safety police in private sector non recording system research record of information and statements,of qualicafition not meeting need to re rwiten supplement retake survey assessment for meeting circuit phase design.
- 1.7 theoretical framework : pratical framework phylosophie,the framework qualicafition circulum implentation idee concept irregularite regulation record mark sheet time table design career combination career system phylosophie concept ,cognitive attandance day ,time table allocation design assessment day development day design in system integration national framework originator idee engineering phylosophie sgb ,phylosophie seta edpseta department education integrity system analyse dyy and college idee ..rural sector meeting
-;1.8 methodological approach :
Methodologies teaching system police academy institut college semester engineering electrical time table civil mechanical system and outcome

career designed and inspector of system marker need system .method system
Trade related manufactured information system manager Portofilio docket of engineering studies in policy system stationery commissioning system method engineering no leave no over stock information result no design judgement suspension of assesment and registration leave system engineer design but system need to be corrected after judgement assessment engineering value framework component open circuit need switch off after development system need mandatory nominated system government engineering post assessed. Circuit phase to be agree need resolved crime informer admnise case. System time table for functionality orientation in academic system..that factor nated need to close after open.
- 1.8 paradigm :
Instruction offering in system need to be consolidate idee system teaching
- 1.8.2 Research design :
Research design engineering model field advanced time table outcome day date system erginometric engineering
-1.8.3 approach : system target in industrial education system Approach online center career education library system education policy security education approach social media system rural justice development mediation conciliation.
- 1.8.4 population and sampling: system education population RSA irregularite population
Years young old mining illegal job illegal situation system I ..
-1.8.5 data generation : managent system information collected database Engineering system manage resource recruitment education collected database framework textbook class work book department circulum phase policy saqa circulum on line information generated intelligence system rwiten and college sustrem ..in rural system exploitation design topic framework real and imaginary system on career
-1.8.6 data analysis : management system ,analyse data system information investigation advanced research function of data system definition system data. ..historical

- ethical considerations : low system deotologie permit atabse need to re rwiten resulted was not published was secret online system
1.9 summary and overview of the thesis : the research of analyse system university ucpd on record marking capacity development system exam and insurance system of qualicafition in NN diplomat system in private system non accreditation not registered system need certain value and system speedy recovery certificate award meetbrequit and the principles used for processing my request assistance
-chapiter 2 : literature review
2.1 introduction : in the language award meeting transcript language originator design subject framework qualicafition system agreement rural development system subject line picture plane record transcript language

price of education authentic printers release result statement language skills in Africa system slow accountability factory physic engineering science industrial.
2.2 definition of concepts :
Conceptskey award degree diploma : need framework qualicafition give to student non accreditation or student language no meeting in high education in record transcript need master degree buchellor no meet is project in national trade school student non registered no proof of statement aware irregularite system marking in progress , resulted release. .back log subject .

Faculty engineering business
 Academic police instituts verification

- experimental framework trade

S
2.2.1 work - integrated learning:
System information award degree and master record transcript no meeting and irregularite framework continued professional system master experimental job workplace training system ,basic ,advance field college and compagny design theory seniors lecture learn case junior principal posted close tendered engineering electrical Eaton university Eskom theory engineering Summative Scheiner Microsoft ..
- 2.2.2.workplace learning :
Learning college training cpd professional pratical school attandance lecture pratical irregularite extra mural supplemtaire subject course on 4 subject completed extra subject and combination completed LMS job task corresponds system self peer assessment for meeting system
Eskom city power ,,Eaton , scheneider online sarb sars design project learner hr resource material didactic

-
- 2.2.3 problem - based learning :
2.2.4 experiential learning : learner team duty time, table career technology
- cadet minim senior junior function engineering lecture ,senior trade theory irret and back log subject , teaching combination ncv junior ncv nated engineering studies lecture nated
Years ..assessor moderator framework qualicafition nlrd career saqa ratification aware senior ICT conductor
-2.3 how TVET lecture learn through :
Globaj TVET lecture learn conduct assment ..exper assessment ,guide experiemental workplace application system job task operationel purpose
Framework qualicafition learn system by rwiten verification system design information .by pratical school institut pratical college basis advance

collected database system on line web cybercafe ..
2.3.2:regional context on how TVET lecture learn : jhb system Gauteng department high basic system ..
- knowledge TVET information system management b,gained intellectuel on job vocational self discovery system peer . irregularite extra subject. Position on job posting resolved task ..
2.5;conceptions of TVET lecture learning :2.5. global context on caption of TVET lecture learning through , information regulation ...Job sector mining labour skill oversea system learning design ..
- 2.3chapiterter summary:
Summary field topic operationel engineering system design analyse investigate new era language learne regulation
- 3.1.theoretical and conceptual frameworks.
3.1 introduction :
3.2 . experiemental learning theory background :
3.3.1 stage ,concrete experience ,reflective observations
,abstract
conceptualize
,active experimental -
Input output learn underprinted framework concrete,design framework qualification phase preliminaries phase finalise quarter phase step.
Learn ,insurance learner step irregularite phase completed insurance regulation step compensation phase award certificate training workplace phase final concrete training teaching framework engineering study undertake system , qualicafition examination degree .
-reflectiin observation ,learner facility moderator personal check open book close book class distance report seance .
-bergami and Schiller's ,2009. Industry replacet model :
community : learner academic policy and school based teaching national trade
engu,
industry placement experience , industry placement skills
,classroom,
 development:
Theory placement b..
- conceptual frameworks:
Shulman domain of teacher knowledge ,soft skills : on line web design power point azure develop projection rural system
4 . Chapter 4 , research design and methodology:
- introduction .: design method Socratic platoon method irronie irregularite system ironie methode liceum sophitic method college private system non accreditation apostolate system.
- ontological assumptions : irregularite system implenteed was remarking progress system
- epistemology assumption : progress system marking framework design language translation African language trade to USA slow urope system

framework no understand system need
Case.
- interpretivism: language master course record transcript judgement trade given irregularite marking undertake planing Poste teaching language scaling up Datin up grading cycle equation resolve

- methodology and axiology : concept was no extended in system define was no t repetitive after you date loss idee
- research : approach research approact : study population :
- convenience sampling .
- piloting .
- data generay.
- interview : job experimentatv interview ..
- trustworthiness :
- credibilty yes
-: transferability. Yes
- dependability. Yes
Conformability yes
- triangulation yes
- limitation of study yes

- 5 research site and participant profiling :- introduction : participants profiling :

5.2 work expert in the industry : irregularite material script trade national ncv skill acting industrial irregularite lecture training ,trainer faculty NN diplomat bin industry exampt application job re design letter. Experimental in years meet framework and cpd continue subject in college design learning teaching b..
- teaching experience in TVET college ..
5.2. research site ,Eskom ,city power Microsoft Eaton on line web site
- policy met :
-;teacher education programmes .:
-education technology regulation orientation life language vocational orientation education meet requirements master skill trade manufacture process technologie ,public college ,private college .
- compagny 1 college St peace college
Compagny foreign institut ,university ucpd ..
-placement industrial :

-age group |qualification |job designated
- 6 .Data presentation and analysis :
-6.1. introduction : framework
-induction and mentoring : irregularite system course base private system

and public system
- learning through planer unplanned maintenance and repairs :

-;learning through document of pratice : textbook subject guideline book
- learning through diagnosis and troubleshooting.
- learning throuble the use of machine and equipment machine

-; collegial section meeting :
- status update and action meetings
- information sharing meeting
- learning through reglecti
 qualification data base system ,,retrieve resulted ..
- safety talk procedure

- reflection in pratice :
-leaening through networking
- safety workshops
- learning through housekeeping
- safety talk and procedure
"6.2. Data presentation and analysis

- introduction :
- general pedagogie knowledge:
Irregularite material pedagogie learning self peer circulum methods

Using machines
- curriculum knowledge:
- soft skills ,
- computer skills :
- communication
- decoration material recycling skill
- automation skill
- programming skill
- the use of computer numerical contrik

-
6.2 .1positive aspect of will experience ,
- 6.2 new skills and kny: irreguy skill framework ncv panel wiring plumbing brickline , diesel Moto mechanic civis engineering lecture ..
- long working hours : 12 h , 6 h
- bureaucracy and setbacks .
- personal devslot belief ..
- industry links ,knowldgy ..
- methodology summary and recommandatiin ..
- review study discussui ..

- lack of technicK skill among lecture is operating machine equipment ,P irregularite and regulation. Extra subject material script and NN diploma experimental framework qualification n diploma ,advance field lecture master
Education technology
- promotion will self initiated through induction process :

-tvet lecture gained technical know how about industrial process . Experimental regulation irregularite sector rural mining energy education system in learner non registration working operationel geotechnical mine and manufacture component sector trainer non trainer no facilitator.
- creativity and cost saving skills among civij engineering electrical irregularite and NN diplomat TVET lecture trainer ..
- lack of problem solving skills : irregularite trade theory subject and non qualification subject no outt problem completed mark sheet completed cod council on job senior experimental teach job theory resolved subject learning extra subject ..
- lack of lecture will support : recommendat based on key findit : , Recommandatiin job extra circulum lecture combination recommendations component project printer extra subject project Sita fail 3,2subject final subject recommend lecture to completed note ,and re orientation cycle essential with learn advanced correction Portofilio asditionek information revaluation review information irregularite statement re statement service compensation insurance award labour , granted lecture and learning education technology outcom phenomenology teaching
- contribution of the study :
- a proposed model TVET lecture wil :

- structure of model :
- role players :
- challenges and benefits :
- model summary :

...

- lecture perception of effect of internal continuous assessment on students

tertiary vocational education and try TVET college .
- computer pratice module lecture experience of internal continuous assessment.
- drawing from an interpretivist constructiviste theory cognitivism guide data collected structure semi interview data analysis method the finding + Plan TVET influence by variouse stakeholders and in addit should police of regulatory bodies .lecture are able to assess differents styles of learnings in order to allow ,learn oppot studies divers need derived forms the basis of this ..
Pratice module lecture experience ..student understand interview based assessment observations praticakbself assessment field praticaj coming know in training normally criterysj process ,evaluating executing assessment are necessary research has found experience .
TVET lecture normally requirement activity service expertise executive lecture reporty experience typing examination during which previouse some lecture ..does not meet .according to computer .
- report that lecture felt papper work ..student not see relevancy of the circulum and assessment in relation in their future and assessment in relation become demotived their evantuality students are irregular attandance due lazine because they have relation insfracture bsucg computer printer and project is problem .operational no internet access study qualitive research aims essence of occurence
- lecture responsabilty is to conduct lecture and assess studeh practicaj ,lecture should an assessment schedule at the beginning of the semmester schedule .
- study qualitative research aim understanding situation from particiodb making bgrouo assess computer busing Groupon assessment session participt indicated operational ...
- lecture indicate assessment finaj achievmey , qualification found that lack appropriate supplementary training moderation it was assumed that lecture attended in service training ..expected subject outcomes coincide college lecture are not trainer as assessor moderator in order ensure standard lecture are required develop assessment
- files which continuosly monitoring to dhet to very the presence of the assessment evidence . That assessment plans were designed process of assessment ..time allocated for teaching and assessment should ensure that -;lecture are tasked with the planning and implementation of moderation marking administration of remediation activite and recordi of assessment marks lecture are also required by the dhet to keep files the circulum constraint student in some case the assessment process do students included content had subject disciplinary lecture COVID can assess large group studentb division time required to able called to able to cover all the workload as invigilation time was extended as invigilt time was extended finding showed assessing different grouo strained the time available for teaching learning and assessment ...
- purpose of study was to explore computer pratice module experience of

internal continue .assessments in TVET ..though dhet issued gyidedline to ensure correct process is to be adhered ,icass based constructivism theory study provide the literature in lecture experience of lack of proper quality a selective approach to choose lecture to attend in service training time constry pappers student absenteeism infrascture and equipment barrier done lecture management of the college of umalusi levej moderated before it can after the assessment provided with feedbat . Should lecture comment for improvement in their learning

_____

- project :
Electrician sector trade duration 2 years trade electrician semmester trade

national qualicafition hours ..
Visited to transmission distribution substation ,10 hrs draw actual circuit diagram of substation visited variouse component plan assembly solar panel erector overhead domestic service
- line and outline variouse power plan layout .
-prepare layout plan and identify different elements of solar power system .
- assembly and panej for illumination variouse ways of power generation power by non conventional methods power generation by solar generation by wind solar energy .principle and operation of solar panel .
- erect overhead domestic service line and outline variouse power plant layout .
- pratical installation of insulator of used in the / Lt line for a given
- draw single line diagram of distribute .
- measuremt carrying capacity of conductor for givent power .
- fasten jumper in pin shackle and suspension type insulator .
- transmission and distribut networks line insulators ,overhead poles and method of joining aluminium conductor
- erect ovehed domestic service line and outline variouse power .
- erect overhead service pole for single phase 230 v distribuyb system
- install bus bar and couple safety precaution and ruled pertaining to domestic service connection variouse terms like maximum demand loaf factor ,diversity ,plat ufility ,
- exam faults carry out repairing of circuit breakers .
- identify variousrse of relay and operationej .
- pratice setting of up current multiplier for relay operation
- test tripping characteristic breaker for current and short circuit pratice on repaired ...maintaining of circuit breakers types of relays and it's operations types of circuit breakers their application application and functioning ..
* Electrician ,duration 6 month week assessing training ,trainer week
- learner outcome assessor and learner trade with indicative hours professionej knowledge .trade theory .
- project work / industrial visit broad area .

- battery charger / emergent light .
- contrik of motor pump with tank level .
- DC voltage contrik circuit using relay .
- alarm indicator circuit using sensor .
- electrician electronics pratice ,determine resistance colours code and identify types the .
- objectives are the end of this exercise you ,
- identify the type of resistor by reffering to the pictoriaj .
- identify the colour bands and decide the resistance value calculate tolerance value by the colours band measure the actuaj value with an ohmmeter verify with calculated ..
- tools / instruments , multimeter ,ohmmey , materials ,varioisr types of values assorted value include potention meter of carbon track and wire wound fyle as required .
- identify of resistor pictoriaj identify type by reffering type write .sketch the symbols ...

India. ..Asia qualification certificate chine award original country ... combination ncv n nated.

_____'_
Project :
* Qualifications through quality training system for electrical power engineering
- animation presentation or complex training material
- project based training media adaptable to any training system .
- from power generation consumption the intelligence i electrical power grid of the future networked system in the power engineering lab
- networked systems in the power ent lab .well equipped for the future .SCADA power lab soft the entire ar glance training system the power ent lab is a complete ..
- fundamentals of power engineery ,DC,AC and three phase technology ,unitrain -# .
1.magnetism / electromagnetism uni train .
- measurement with multimeter
- main system models ..

- control and synchronisation
-generatlr protection
- renewable power .
- photovoltaic power
- advanced photovoltaic ywind power plan
- fuel cell technology uni train
Investigative transformers .
- transformer protection .
- power transmit .

- investigay on three phase transmisst line .
- transmission line earth fault compensation .
- transmission systems with synchronous
- generator .
- line protection .
- power distribution .
- three phase double bus are system .
- overcurrent protection double bus

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- project :
- experiments measuring the band gap of a semi conductor .
- Experiemental 7 thermoet effect .
-Experimement 6 measuring the induction voltage in a conductor loop moving within a magnetic field .
- experiment 4 analysing the thermodynamic cycle of the heat pump using the moiler diagram experiemental # magnet field outside a streigfht conductor physic pratical determining speed :
- warning tt undefined function experiment measure magnetic field magnetic field of air coil ..
- objective : measuring the magnetic field B of a long air coil as function of current I measure the magnetic field B of a long air coil as function length L and the number N of the length L and the number .turn ..
- apparatus 3 coils high current power supply ,@ teslameter ,@ axial B probs ,1 multicore cable ,6 pole ,@ m long stands per tube ,, equipment set diagram coik tubes variable number of turns per unit length the high current power supply was connected to the teslameter by means of the multicore ,cable clamped with stand DoD from scope of supply of the probe and aligned so that the hall sensor ,was positioned in the centre plastic ..
- experimental procedure measure as function of current the zero of the Teslametr set zero the experiment was repeated for other 2 coils ..
-; theory bio Savar law implies that that sum of contribution gives to the magnetic field generated at location P by arbitri conductor through

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*1.. Overview Fundamentals :

- course structure of power electronics.
No topics :
- lecture ,hours ..
1. Introduction to power electronics .
.2. semi conductor devices .
3. Review electrinical concepts .
4. Line frequency diode rectifiers.
5. Line frequency phase controlled.
6. DC - DC switch mode converter .
- PSM with bipolar and unipolar switch

8. Switch mod DC ,AC inverted .
-9.power supply application .
10.Motor drive application .
11. Computer lab

A .new the power programm lab ,volt equipment power pole board lab covering
-combination of totakk methods ,structure of
- transf

...

- project :
- new developed power electronics and electric machines laboratory is strongly coupled .
- with power program requirements of .
- course structure .
- with help of three modern facilities modular lab volt equipment power pole board and dspacd all topics the two prerequisite course are covered in the laboratt course efficient utilisation and combination of power electronics and electric machines laboratory ..
- structure of power electronics and electrical machines laboratory ..
- topic description equipment .
- * transformers determination of transformer parameters by performing no load and short circuit test voltage regulation and efficiency lab volt ,AC/ DC rectifiers .
-operation of single phase Nd three phase diode , thyristor rectifier lab.
- introduction to DC ,DC choppers buck boost choppers ..
- verificatt of output voltay versus duty ratio ,the effect of switching control signal frequency measurements of the output power versus input power lab volt..power pole.
- variable voltage variable frequency single .phase switch mode single phase and three phase inverters lab volt power pole ..
- synchronous motor and generators .
- the effect of load changes on a synchronous motor : the effect of field current changes on a synchronous motor the effect of load changes on a

synchronous generator .operating alone .
- introduction to dspacd : mechanical system modelling ex of building a real time system through Simulink operation and contrik of DC machines ..
*
Induction motor determination of induction motor parameters : steady state performance at various torque loadings control of induction machines ..
* Laboratories workstation university constt of three lab volt test benches for power benchdx..
- the lab volt power electronics training system is a versatile,flexible ,modular and complete teaching system for all different types of modules ..
- ammeters range (1-10A)
- voltmeter range (0-500V) ..
- experiment diagram ,result transformer load voltage and current with different load and current with different types of loads ,mA,,V
Load ,no load ,lamp R ,inductive ,l capacitive (c)..
- experimey no ,cage rotor ,sauirel phase induction motor operation of a three experiment .
- namevin start delta circuit .
- objective : operate the three phase induction motor in start z d the in delta connection find torque characteristics equipment required .
- three phase inducty motor ,type
- brake unit type
- control unity type
- universal power supply ..
- three phase motor with squirrel cage rotor,equipment required .three phase inducy motor ,
- brake unity ,Tue ,control unit ,power factor meter (10A) ,ammeter range (1-10A) voltmeter range (0-500v) result ,2nd sub ,@st value Min ,speed pull out torque rated speed no load characters points at ,nr
(r.p.m) ,,T(N.m),,(kW)
Result table ,speed pull out rated no load ..efficiency ...
*
*_____
*
- experiment diagram: building modern power and electric machine .. laboratory .
- topics :
- lecture ..
- review of basic singly / three phase circuit .
- review of rotational motion and magnetic field , the linear DC machine .
- transformer ,ideal transformer ,
- peak single phase transformer .
- introduction to ac machinery fundamentals ..
- synchronous generators the speed of rotation ,internal generated voltage equivalent circuit ,phasor diagram power and torque
- synchronous motor : basic principle of operation :

- induction motor basic conception
- equivalent circuit .
- power and torque ,torque speed characteristics ..
- * 2.introduction to DC machinery :
Load (R= 1kohm ,experiment diagram
Result table primary side |™secondary side ,V,A,V,

- experiment no
- experiment name : determination of efficiency and voltage regulation of a single phase transformer by direct loading .
- objective: determine the efficit and voltage regut of a single phase transformer by direct loading ,equipment required .
- transformer board ,
- single phase ,AC power supply 230 V and 50HZ ,, 2 mmeters range (1-10A).2 voltmeter range (0-500v) ,2 wattmeter ,load (1kohm ,,
- experiment , experimey name de,, load characteristics of the single phase transformation ,objective ,determiy the no load characteristics of transformer ..
- transformer board : single phase AC power supply 230 and 50jz ..
- regulating transformer autotransformer.no load characteristics of the single phase transformer ..
- experiment ,
- name single phase transformer current voltage ratio with different type load ,
- objective : the object of this experiment is to measure the load current and the secondary voltage ,of single phase transformer with differents type load , equipment .
- transformer board .
- single phase AC power supply 230 v ,50hz ,
- resistive ,inductive and capacitiver..
- dependent on the sensitive of the hall sensor was minutly sensitive errors surface around then the magnetic field values measured were not entirely to coil ..
- to reduced error ,experiment were done to compare the results afterward since there were only slight diffey there the experiment...

_____
..- current I is flowing the sum is give ..
dB= uo.×I×ds..
r.Eq×(I)×4×π×f×# vector from the respective conductor the point P vector ,D's describes the length and direction of the indiy of conductor ..
- calculating the total magnetic field for computation integral ,usually the integral is complex to do but relatively easier for conductors with certain symmet where an analytic solutt obtained ..
- for Cass where the field of a long coil is calculated Amper law which also derived from equation is very. East Amper law B× D's = mo.j = uo ,where ,j

current density ,IA : current density , area ,s closed boundary curve ..
.d
- A and s are chosen in order calculate the magnetic field of a long coil the magnetic field of a long coil the magnety field inside the coil is parallel

- sufficiently long and almost vanish the componedary magnetic field in direction from zero. ,there force obtain ,b D's = Mo.B ..D's.B.K ,,where ,l : length of the parts @ ..
IA= N (IV) ..n: number of turns inside , I current through the coil ..B= u× o
Experiemental the magnety field inside a long coil will be measured an axial B prob in order to verify the result ..probe contain ..
* 2 analysis of results :
Using B= u× o plotting B against I give us gradient m= N× L ..
Discussion : the experiment investigated the effects on the induced magnetism of changing the current flowing at fixed number of turns of the coil ..for graph ,y intercepy were so small for , B = ml coil random error might. Have setting ,accuracy of the experimental depend sensitivity error surface calculation object around .reduced the error , experiemental were done ..
*3:conclusy : result take from B = m.× l magnetic cyclinddf coil is directly propot to the current flow in the coil if the length of coil and the number turns is fixed ..

- experimental :measuding the magnetic field of an air coil .
- objectives : measuring the magnetic fields B of a long length K and the number N of turn of coil apparatus ..
- 3 coils ,1 high current power supply .1 teslammeter ,1 axial B probed
- cable ,6 pole ,1,5 m long ,1 stand for coils and tube ,sAddle base experiemental set up
- the equipment was set up in diagram ,coil. tube number turns per unit length variable ,high current power supply length and connected to do it ....
- the axial B prob was connected to the teslamet by means of multicore cable,clamped with the stand from scope , experimental procedure measuremt as a function of the current I the zero of the
Teslametr ,calibrated with the key compansation a measuring range of 20 Mt was selected at the teslamet ..
- experiment 8 measuring the band gap of semie conductor , experiment thermoelectric effect , experimental outside a straight conductor
Compagny : experiment name..verificatt of the transformation ratio of the transformers .
- objective : determine the transformation ratio of required ,single - phase ,AC power supply 230 v ,50 Hz ,regulating transformer auto ,2 Mmeter ,range (#-10 A ,voltmeter range (0-500v) ,2 wattmer

...

- project
training in electricJ wiring technical using..
- training content :
-;design and function of various rcd ,
-din vde 0100-530 2005
- design of selectively stagger fault current protection din vde 0100 419 ..
- use of type BRCDs for varioisev..fault current..
- measure and evaluation of variouse tripping ..
- induced ..
- main system variant TN ,it system , generation DC for variety,30m type, 300m , Ddition earthing Nd fault simulation resistor ,measure buton to protect againheat damage ..
- PC interface educational softy and fault simulator ..wiring installation pandk communicRion technology with planniy installation incorporated .panel measure.
_____----

Department of defense require contrik of electrimay interference characterisft of subsystet and equipment ..
-; purpose,application ,talliring of reauireh ,emission and succet designation ..
- applicable : govermey documents ,drawint and publication , order goverment ,generaj ,above

Mil data output STD - 461S CE10@

limited level (db A) ,frequet (Hz) 130 ,,
- purpose..this procedure is used go verify that from not exceed - input leads includ returns
- test equipment ,test equipment ,measure receivers ,currents ,probes ,signTor , data recording , oscilloscope ,resistor ,stup
- maintain setup shall be , removed device when approved by procuring activity ..

- calibration configuration the test setup measurement system
- position current probe 5 cm from the .
- test procedure ,conductivity staff , 1,5 meter ..ground planet , power source frequence 10k ,@00 km ,@ m
- emission and succeptibity : conducted emission power lead , conducted emission antenna ,intermodulay ,15khz to 10ghz ,rejectiojnundersuddrs , impulsion successprible damped sinusoidal transiob cable ,
- radiated emission electric field ,19 khz to 18 GHz ,radiated emission electric field 19 khz to @8 GHz ..

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-Project:
Experimental degree level
- trade theory and pratical engineering power in compagny training city power trade industrial and Eskom trade industrial service department , service trade job Engineering power education technologie power and manufacture related design power technology and energy design layouts interpre ,power DC DC AC concept overview council ting by Engineering power advance skill energy conception theoretical. Tradman design engineering operation basic advanced tasking operating courent trade after conception overview by Engineering university and discovery overview integral extentiox definition axiom education. System engineering license .s enior principle buchellor degree overview council and trade engineering .Trade Engineering design basic operationel task tools hand and operationel..planing tradman wiremane service artisans in power plan and technical categories scheduled day

-1job title trade assistant job grade task 4 :
Job reports to : team leader .
- job purpose : assist electricians with restoration Of work orders with general duties include ..
-1. Support the execution work orders with include :

- 1.2 prepare and maintain equipment tools and materials for use .
Manufacture processing join cooling process high low voltage , manufacture remanufacture system adaptative
- 1.3 fetching equipment as required :
- cleaning site area before and after work execution :
- clean vehicle and fleet utilizes .
- clean assist in the aithorized erecting of scaffolding ,movable and immovable stagit and variouse rigging to gain access to difficulties access safety policy procedure :
-comply to safety health environment and quality requirements.
- adhere regulation.
- identify hazardous conditt and faulty equipment that can impact overall safety .
- adher to the organisation environment management programme and policies .
- participate in monthly toolbox talk meetings
- contribute toward work risk assessment for work conducted .
- executed general work that may time in support of daily maintenance and repair to ensure sound electrical infrastructure minimum .NQF , equivalent grade 9 Aber level 4 following requirements will added advantage .NQF1to 12 equivalence n1to n6 lecture. Senior. grade 1 to 12 found intermedi senior work
-;senior manai ,professional qualified Lev 5-6 ,,skilled technical level 7-8,, semi skilled ,level 9-10 ,level 11
- total temporary :
-percentage standing race ..
- grouper | male femL foreigner totaj .
- senior managent ,Lev 3 - 4
-;professional :
- employee induction : employee induction is the first step toward gaining an employee commitment induction introducing compagny ..
- to the employee and the employee to the company induction involves the orientation of the employee in compagny culture .
- introduction the employee condition policies expected conduct the aim is to conduct .

- reward policy : the remuny policy was renamed to reward policy , schedule of payment guidelines is a consolidation of 2 policies ..
- boost compliance ,capacity development programmes must staffing and optimak use of the workforce adhere to transformation imperative employment programme regular and organisational directives intent embed a culture of accountability
- gaining stakeholder commimey across the boards .
- delivering tangible change in culture behaviour and attitude

- setting the ground work for future implementating improvement and sustaining organisational process levek..
- employment equity and affirmative action plans and programmes. As desire ..integral to building a workforce that reflect the demographics of the country the has been an ongoing focus on the development of taken.emergent employment equity establishtb,
- target achieved target employment overall improvement in comparison it also important note that equity plan profile and seek to ensure that we note the drop from previous years in the ration related ..
- overall employee landscape for each occupational skill level occupatt skill level male female total
- top management
- senior manai
- professional qualifications
- skilled technical .

Semi skill

- senior managemy professional qualified ..

-total ..integrated

- table : tendered procedure :
- pricing instruction
- firm schedule
- agreement contract data ,form acceptance
- returnable document for evaluation purpose ..
- municipal rate and taxes ..not irres the more than 90 days ..
- Shea regulation ,invitatt, validation central supplier , additional ,bid ,letter good standard .

- scope of work :
- evaluation criteria

- specification for quality of supply statistics and check ..
- description schedule ,electrical for QoS input ,
- power supply per clause .
- main supply frequence as per clause ..supply protection requirements as per

...

- project

Council engineering ,

- code conduct 2013 and has been public under eny profession act ,2000 act

46 of 2000 notice 256 in governmy gazett .
-:advised notice are ,
- faillure of concrete retaining block ,walls in RSA ,consequence of filled walk next stream ,inadequate a of timber roof structure followed by unacceptable remedial work ,resulted of failed concrete foundation ,importance of taking loading building structure ,advise legal requirements for employing professional to perform engineering service , role responsabilty of personal appointment small building ..
- case studies : engineering related matter has prepared case studies rules..
- inadequate design and lack of monitoring of erection leading of a strange ,
- consequences vof collapse of portion of three storey office block ..
-;collapse of structure aring faulty of steelwork .
- extrem implication from contravention of rules of conduct a small project ..
* Ent council RSA council ,
- case study consequence collapses of athree story office block structure .
-the project : three storey office block with reinforced concretvstruts comprising comprise a parkit basement with two floor and roof support by timer occupied foot approxiy ,75 m×✓40 m worker reportly injured one was killed and another missing the department labour and ecsa expert revealed the cause of faillure of the structure was like punching Colum flat been carried engineering bconcerned ,proceed investigate interview design career evidence existed of improper conduct by register engineering improper career judged in term ecsa rules responsabilty design the Engineering design the point we're note engineering didn't sign the A19; local authory concern confirm appointment as person design a safe bearit pressure under footing slab not issue drawing or bending schedultb only provide sketch instead calculation for design structure not be retrieved b opening in theft floor takeb soecisj account geotechnical investigation was done verbal giving apparent to allowed enibwas not competent to design the structure b in question his methods of execuy the the drawing negligey and no appreciate design of the complexity the was accordingly charged with contravening ruled of conduct follows 3(2)(a) fail do discharge is duties ,skikkb effienciency profesdionek ground knowledge due care jointd cut Education training tendered and experiemental competent to perform bregard priority resoinsabily sought disciplinary eny pending a hearing by tribunaj pratice in the professional in the view seriousness material consider complain temporary against the enu charge discipline heariy tribunaj callaspe was not for producing structure design didn't not pushing faillure knowdge scope wirk the load culminat the Engineering appealed again decissy tribunaj was dismy the cancellation of engineering registration was subset ..number of lesson to be learned exist in various area in design of of structi , geotechnical inversty was carried out enable apb include limited site visit design altered reliance was on the propy of the sub surface materials occuring geotechnical investigation was carried out enable appropriate foundation design generaj in the era the check of the design of structure indicated footing could have exceeded the assumed value

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-; engineering electrical St peace ,
Filed // St college index published find model
- report ,I'd number examinator ,center examin ,time table electrical ei ,saqa I'd requirements
- assessment policy engineering weigthing value saqa award degree y suplemetaire ..
- bookmark descript | mark word Mon | re mark Min max |

- textbook| 100 PG ,100% knnowledgy analyse not ,book ,
- note book ,copy book exercise Revit informed | comment feedback award schedy Amanda informed recruitment mass weigth .
- topics subject
Learner explanation electrical en,trade theory electrical 80pg , eny science Engineering drawing mathematical ,business electrotechnology ,orientation
- assessment level ,5 /102/10 management informed traffic traffic low ..exam papper quality subject sheet ,400 page ..
- total value. ,980 PG ,100% , | 980 award certy ,n 1 ,| out
- ---_____

- security high school and primary school ,college disciplinary conduct keep zone secure private securite licensed ,duty guard officer , general and special level @,3 sasseta psira grade a,b,c,d eauipmt on book ,access book instructy book , uniform certificate licensd prinvafd instruction book ,provide maintenance conduct patrol officer daily may class patrol car foot area academic meeting ..
- serier number time in / out : 0000
- nature occure : booking condition meduim complain evry things order no complain .
- action take correcfi action : preshifg ,post shift check registration check batteries statemt revision .

- record transcription month years : record student book no low filling booking data review text order booking amount value ,R leave days holiday charge missii record report double ..
- conduct access search sanitizing fire ,key contrik property found ..
- Serie : 000/000h00 commencer.
- search in out cancell book ,€ check print out in number
- record cancell : reason booking
- reaction fire health fire inspection monitoring auditing investigate ,unity national officer resooy
- Serie : 000/00h 00 commence € peak upn react Pro active : booking / action book react health fire .

- intervention armed ,
- supervisit conduct ,
- management conduct ,log actiy VIP assessor instructor ..
Serie time : 000
- compliance complain : bookiy resource mat humain materiat award statistic .
- record : supervisor organisation orientation assessment financisj ..
- brigade : safety high and primary school graduat discipline code conduct keep secure ,duty safety levej sasseta equipment on book uniform licensd preveni low criminal justit low police theortb,metropolitaing guard sector sector criminsj ,criminoloy security low extendure tenure
- Serie number time in find : low concilili proboni transcript record in out 000/00h | nature occure booking script book copyrt debuged file informed :
- action take corrective active offensr : preventt charge take sign warning notice low defeni ruling regulatory assessment dischary warning write discharge load overload prebt exchange ..

- record transcript month years : performat book in out learner report verificatt report on the conduct of nationsj examination

- builds visitor student ,lecture externat examinator chief ,plan pin point acadet ,evaluation elevator
Post pratical security ,safety police recepty secretaire post office ,security main patrol access reaction supervisor warentvtraffic lecture registrar student post internal external brigade assessor paralegal post low lecture court student legacy orientation filling room claim correct post pratical Engineering information desk learning workshop post levekv staff teacher security grade levej team time lunch time praticzj kdgak attandance ,registration post Patrik externaj Patrik car vehicle post lab policy Consol component trade equipment safety material consij networh pratical license number permit parade meeting school academic platiot faculty subject chart layouth design analyse posting era histograt investigation report informed manager map plan report claim observe Cass study lindv .

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- Project
St peace : college and institut

Acadet students brigade .
- sector St peace integrity guard academic officer academic police defense academic
1. Purpose topics :
1.1 recrt : student learner lecture acadet staff volunteer job student rank ,level 1 to level 11
1.3 job requirements : function task operation skill ,lecture and learner minimum cadet junior senior .
1.2 required : guard faculty posted duty allowance salary wage rand award ..
1 .3 requirements :guard faculty posted duty allowance salary wage rand .
- rank officer : general bridge integrity acadet ,inspector academic survey academic disciplinary hearing commissioning academic facilitator academic assessor moderator .
1.5 attandance brigade : body academic morning shift afternoon shift night workplace academic compliance ..
- on guard posting rosta ..
- faculty posting and posting carry duty key ..Mon tu w Fr the sa sun sign Mark

- faculty Eni name brigade ..
_:faculty policing traffic low paralegal study material fire Rm security safety ,arm security safety .name

- faculty business account cashier hr namev
- faculty nursing secretary medical health officer promotion ,name brigade ..
- faculty engi it computer officer tech ..
- faculty matric technical math africass life orientation English isizulu social deia , intermediate .
- total grand record sheet month semmester v

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2.*Key learner : Portofilio evidence low topics learner:
-integrity guard : security keeping circulum class work attandance class job learning lecture keeping access patrol academic class survey reaction physical acedemt course class transcript academic record report academic on duty ,safety academic disciplines governance low prevent fire traffic academic low circulum course class transcript academics record report acadet on duty ,policy warrrenty academic course class transcription acade record report academic on duty management system information learner and academic communication skill criminel resolved principle invesrigat incidence college east legaj financial legal traffic low management circuit low court academic conduct ruling police procedure defensive regulation offensive action take corrective action take ruling regulation subject ,record report academic on duty ,and assessment exam time..
* Job activity relate survey brigade on site a addmic institu and extra circulum out site academic on external course visited subject and meeting department Education external assessment exam or quiz note pratical work

inyernershio :

- activity faculty learnit security safety Eni relate trade theory Pratt workshop policy eny course subject ,check research conduct pratice in good wear after tools hand evacuation conduct ,first aid course faculty policy search check studies materiak competency license fire arm ,ammunit control ,faculty it technology computer safety security search check conduct course laptop sorkstaty computer informay design meeting reauiremey I'd access number ,faculty business account search cashier fiscality book ING statemt bulletin course subject ,search check faculty nursing health search check safety health conduct conduct wears practice workshop health equipment cleaning workspace ,educare teach matric check search course subject methode research planning lesson required textbook .
- circulum brigade ,facut parade studies activity over academic extra circulum meeting dhet meeting protocols policy gov meeting criminal report Bandi academic lecture criminal circuit gangister lecture over psychopedagogie social academic memo faculties transcription record record academic disciplinary orientation Manuel crime brigade research copyrt pliagiart criminal academic textbook photocopies crime scene transcript result academic usage fake statement non report fake note course usage corrective action take conformance report evidence accuracy result time attandance fake registration compliance ..
- allowance salary wage rand award : cost day term award booking pay attention beneficiy intellect loan ,bursary cosff shift booking rwiten ..
- record claim : course ent safety Eni police tpm eny militaire mil on guard step policy engineering keeping course result facilitator module subject mil safety time table lecture learning module chapoter claim extra circuit .
- visited police visited safety calamity patrol claim is permitted inspector I'd homes affairs officer claim I'd control circulum mil visited site engineering labour workers career outcome claim close tendered on job doing city municipat officer claim statement public sector plan operational metropolitaing unity detective intelligence sector claim. Reclaim .
- module verification trade service engineers sector council qualicafition meeting
- disciplinary heart registration attandance days course learner ,on book ,to pics activity ,module memo allocation table marksheet .
- date and time Serie || occurrence || action ||| sign ..

- judgement process book transcript record academic learning ,casebook topic activity transcript I'd paragraph review ..
- data application | occurence appllicNt ,responder | decission order casebook ammandement |€€ award reward certificate transcript academic ..

__'_____'_____

- form complaint and affidavit academic

- name complaint :
- I'd number .:
- address complain :
- cell phone number :
- level complain class :
- reason complain :
- answers affidai sock :..

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Investigation for from result complainant academic ,result low academic 2 week term ,report from academic crime scene ..

Student name topics : tshingombe

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Project ,
Education policy circulum grade ran circuy .grade : 1,2,3,4,5,6,7,9,10,11,12,12. Caps rank :

-
Company name.
- service providers are encouraged to use the indicated URL link for the diwloy painted of South African police service pdf tender document ..
- http : www.etender gov .Za , advertised tender ,
- bid invitat bid award quotation employment docket system CV database system chain delivery bill compensation financial amendment indicator ..
- contact Mr | description ,
- supply delivery installation and calibration of analytical balances and accessories for period of two years ,

- supply commissioning and training of gas chromatography mass spectometr GC ms instrument over three years for forensic science laboratory including service and maintenance agreement chemistry section...
- category work basic advance filling engi technical trade man 1- 12..
- framework level .module faculty police engineering nursing business PC ,it sasseta accreditation , safety security safety engineering manager labour

- curriy information desk assessment police Framework curriculum stations information system ,eny design energetically ..
- task Manuel ,operation Manuel. Lientel complain claim require Manuel admire manuej function Manuel database supply close criteria , @,2,3,5, private system ,alarm CCTV. Control term data

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1. Company private policy private commission department section unity compagy assistance unity assessment policy private space unarmed integrity militairy .
2. Coverage assessment private unity compagy sector integrity unity guard intelligence direction private space assessment .
Pace assessment .
3. Registration compagny agency sector ..
- 3.2 Cipro compagne intellectual property sector policy sars term policy ..old uif registrar policy processeur sector compagny labour .
- sasseta sets policy sector private property term accredit credit sassy .
- homes affairs work permit intellecty management system policy .
- merseta council ent sector term policy militaire term warrenty claim design .merseta counciy eny policy term claim registrar ,
- power attorney claim compagy design investigate policy training recruiy employmy contract clause clause sector employer policy rank warenty constable salary .logistic form policy Claus's sectorial statutory basical employmy levy post Grady sub station commissioner policy unity unarmed private cluster public policy mil .police mil skikk clause communication -;information may ,
- framework regulati ,conduct investigate ,incidence vehicle management operationel ,parsley ownership criminel low financial .
- traffic managemy road .
- clause sectorial ent policy sectorial
- community policy
- clause policy so iL support
- system policy design compagny safety sector area charge take government safety los prevtion enforcement policy safeguard traffic low warning safety Eni.
- labour regulatory policy safeguard policy safeguard traffic low ..
- security policy term sector conduct unity patrol officd officer security warenty recruitment on book docket book a cesz book policy managt unity special general unity policy officer security warenty recruity on book docket book access book outline legaj information may system safety security keep data term policy private secret too secret managemi book outline legal informat management on book security policy process record clearance system management eny level archive storage emoloymy on book security process record cleareny system management , CCTV Radia tion control technical X ray fire secury ..
- eny tpm policy term dailye meeting meet services term employement

engineering and policy meeting on business term curculuM eligibility i policy term term design intelligy Payrol. conduct dismissal officer and engineering business conduct low unlow break policy term design intelligence patrol conduct investigat policy system award ruling rescission policy engineering technology en low sectorial investigation police unfair basic condition claim legal property ownership script inspection solve resolve crime patrol clocking claim HUD judgement legislation regulation term design policy term patrol safegy prevent warning officer report ginerring prevent defense peace sector private discretion correctional peetial private court process intelligence sectori private planing criminal build resolve conflict ..
- recruity job volunter and correctionel safety service system volunter opprtunitie recruitment tradman foreman safety trafficker alarm psscm detector policy meeting private insurance sector Larm pssm service unity information recruity private process private alarm cash store registrar privates camera control system radar sector alarm meeting response factor policy claim bi response private policy radio technic circuit caps response psssm detector ..
- 8 organisatt planing stutorial management company top management cadet minim senior rank support service client response 24h 00 station commissioner commended operators system post development position office post rank station complain .site client Cass warenty visibility private site support deplo mission permission unity police level soacevworj university visibit report investigay analizing planning patrol policy build mining geotech investigate zone sector safeguard secure guard unity permanent work stationnnariet planing patrol policy place hortorinv compulation zone trade binary zone scriotor space unity information permeni job space crime trade investigat body guard protection policy intellectual protectt private intelligy system private response tactical client escort detentt retention polygrat Deb record system buster cop paralegal private system response protection claim Cass limited bureaucracy Deb system health record health detentt private system explanation complain investigation limited bodygy alarm system privacy policy investigate Cass office information order private sector .interveny tactical guard private litigation policy justice private police safeguard commissioner warenty private court process intelligence sectorial ent alarm collection misconduct.
- criteria ,
- category
-qualification emplomet
- salary job
- training sectorial contract skill
- basic excepted learners appreniceshiy levy leave internal audit chairperson deputy management bonus allowance Bais linguistic house home food lunch time award granted cycle job trimestriak semestrt .
- sectorial manufacture ent relate cash flow electrical engineering,mechanical engineering buildt ent carpentry brickine

monitoring ,technology health safety security policy traffic engineering sectorial manufacture cash maintet cash trading theory industrial electricak eny sectory fundamental system license service working trade theory panel wiring manufacture cash flow electrical eny sectory fundamental system license service working trade theory panel manufacture cash flow manufacture low electrical conductor insulator magnetic component AC current DC current manufacture cash flow .
+ Conductor low resistor manufacture semie conductor matter science natural energy power kinetics electrotechnology manufacture electrotechnical manufacture logic manufacture drawing manufacture package sabs sans manufacture supply power operationel manufacture join system low related bulb component maintenance rebuild electro mechanical science build supply low conductor cabling wiring panel switch way PVC rubles low manufacture join way matter coplef ..

- compagny : ...
- compagny support social devet group industrial marketing service trading business issue compagny marketing circuit assessessment cash industrial trading and businesses support.
- statutory: low labour relation skill industrial and trading support cash business service engineers disposat marketing entrepreneurs sector and deposit sectorial manufacture financial ent trading commissioner fund industrial ent design investigate manufacture maintence system support financial option system service engineer buildings construction discovery
- vision , support sectorial industrial orientation support organisa support industrial system engineering flow money cash management supervision cash flow Deb .
- 1.5 submission : sectorial industrial storage money low industrial bank resolving sectorial Bitcoin plank flow air time cash energy manufacture empower metering arm cash Deb resolve network support clustering machinery business economy sector award statement contractor employment volunter days shift and permentt shift workers social support term licensing machinery system .
- sub contractor volunter
- post office post workplace Poste Poste sectorial site term licensing
- the duty operationel system post .
- bid clause certification system ..
- machinery employment ..
- criteria ,
- category
- qualificat employment
- salary job
- training sectorial contact skill .
- basic excepted learner apprenticeship leavg leave internal audit chairperson deputy management deputy manai bonus allowance Bais

logistic house food lunch time award ..granted trimestriak ..
- sectorial manufacture ent relate cash flow electrical engineering mechanical engineering
- building Engineering carpentry motoring electrical engineering manufacture cash maintenat cash trading theory industrial electrical engineering sector sectory fundamental system license service working trade theory panel wiring manufacture cash flow electrical engineering sectory fundamental system license service working ,trade theory panel wiring manufacture cash flow manufacture low electricak conductor insulator magnetic manufacture component AC current DC current manufacture cash manufacture component AC current DC current manufacture cash flow ,conductor low resistor manufacture semie matter science e manufacture semie conductor ,manufacture logic manufacture drawing manufacture package sabs manufacture supply operationel manufacture low join way matter copper .
* Building structure conception head office built office engi manufacture .
- transformation profit trading market mission commissioner profile investment busit section trading office making design platform Cass study office trading design database storage scaling buyer sticjage stick tech stockvel sale planing better mining geotechnical platform induction ..
- the money for engineering syayt license diploma council trade theory electrical t fundamental system permitted section low creation creation ordering supplying

...

-building structure conception head offices. Build structure conception head building office engiy manufacture ..
- profit trading market mission commissioner profit investment business section trading. Office making design platform Cass study office trading database storage buyer stockage , platform market I'd money cost hand guidelines component manufacture demand cost mini shopping Bank ATM manufacture ATM system energiticL money accounting printer permit building scare ligth energy AC DC value added building system at build network telecommunication ATM air fair time charging demand factor consumer money delivery point network a allowance factor allowance system build air time security AC DC build current maximum demand ATM load supply market build DC AC booking air time printers ..

- council engineering Cass study money market stockage learner visa technical pass port project I'd number manufacture cost low shaft and algorithmc project organigram project logigrame Se section Cass study

learning build Cassbook hand book guideline component use manuej visa port control survey operationel..
- manufacture power factor energy demand cost mini shopping Bank ATM manufacture ATM system energeticL money accounting build AC DC current delivery ATM post money source building office printer Lazer machinery build cabling AC DC current .air time build AC DC air time charging demand factor consumer money delivery point ATM allow factor power kWh area build wh demand factor booking air time printers build old system development supply Biden system closely systematic building AC DC wiring system Cass study AC system build switch connecting alteration build mater current projection wiring system Cass AC system build switch wire pipe cabling building manufacture pvs and netr premise manufacture switch outlet socket bulb wire pipe cabling connecting existance alterations build metr ..conception builb size money market trading system development rebuild suplemetaire supply development optionaj reproduction system wire pipe cabling build pv support conception bulb size rebuilb supplemtaire supply development optional support actuary development component money market engineering design intelligence investigate discovery things close bideny build actuarial components money system design intelligence technology build relay contractor motor partie wire DC supply money component appliance electrical fault manufacture system mIntenabilty fault money insufficient fund pins shift left manufacture process hierachi line
...

- project
- brigade St peace report .
- 1. Purpose : report meeting on duty academic .
On book incidence book safety society politic municipality permit authorisation building government political ..
- safety first security excavator machine machine fence unauthorised road way buiy road block give safety public checked meeting security goverment political EFF personl must building site brickline safety control room review revision draw architect vs eny electrical vs plumb electricak must go out meeting shoot cement installation automatically vs safety CCTV fire extinguisher door worn Bantu component safety building draw building science buildt component drawing and architecture plan to buildt .
- conflict schedule safety day roof elevation counter building in progress works 30 day milestone excla action safety inspection labour safety public prevent is Engineering.
- report learner didn't work with form submitted vs student learners talk .
- received policy didn't work form submitted busy to talk when the complaint assessment acadet years .

- CVS labour relation inspector labour job pieces CVS engineering labour machinery labour OSHA safety security labour employee BCEA regulation uif ,n4,N5,n6 ..CVS trade labour eny labour machinery hortoring security office manager hr cvx back log irregy pay labour exam labour CVS labours CVS .uif compagy uif break house machinery hortoring.
- CVS inspector labour engineering security safety level 4 incidence hazard material irregt isita statemtazurs , registration labour ent labour appointment homes affairs check work permit CVS career CVS city power month registration labours is loadshedding must submitted azure insurance labours CVS drawing sheet building want see eny rescue eny science don't want society eny is no longer no court Engineering no process don't machine not low

- building drawing sheet killed metropolicd after manufacture product draw sheet b
- safety first authorisay wear shoot boots mask makarapan machine work plant operations safety control room building security search building must wear security search check .
- orders booking business English CVS formal oral present is form learner in school and for teacher time table form complain and adminstration seta ,sasseta learner LMS money
- money order booking form benefits award .
- report record book ,on book report Serie number
- report order booking form benefits award .
- report record book on book report Serie date time nature action take on duty class meeting brigade present ..
- all in order on duty learner brigade .
- series no compliat to class transcript book acadey everything is fine .
- transcript acadey all in order transcript acadey action take corrective maint action class offensive transcript all in order day shift b .
- report record all the class is order registration key duty transcript non complit no irregy in order irregy action take garde file actions brake failly files missing class .
- pocket book ,on duty leave no complain pocket training all in order class appoint class position shift duty ..
- access book registration time ,in time out registration attandance class 8 h log
- learner name | I'd | time in out | sign

- clock log activties learning | time table pin point azmat severitty impact financial probably risk assesy print in print out time ,
- time complain log actiy class course .
- complain discilli hearing b conduct And quality manat systet .
- complain copyrt , plagiarism copyrity missing fire script class dismiy ..
- school time table break staff 10 h o'clock reason lunch time break staff .
- workshop fire reason short circuit lab class assessment time report

communication hearing conflict resolving private invesy saps member visited class complain class statement certificate back log certificate missing ..
- wire exam missing print reprint .
- complain saqa I'd number name officer warrenty visited evidence CVS academic class found break time table strike complain b ..
- compus reason CVS policy school parantal CVS CVS policy officer report parental guard acadet transcry ..
- meeting report research investigate Academy result research qcto result dhet topicx investigate complain studied method research fund lost investigate .
- financial reward meeting requirements registratt academic consumer complain meeting coid uif defense regulation Cass offence information system docket admniy research ,complain transcript refund , reason transcript consumer ..
- post brigade academic link clust police station commended and security safety community commended link apologize school system no work or operati private schools academic institutions policy deal 24 h / 24 perment to research conduct and resolved docket case study copyright pliagiat time table irregy missing fire script school project deployment unity student internal and external assessment circuy refund lost recovery incidence accidy faillure note dischay governmy system perment meeting parade order system warranty private court and public court office training trainer process faciliy moderator value Poe s evidence Portofilio learner ,
- report make panel rebuildt construction Panel wiring draw exam
- fundamental introduction ,theory lecture no working in the industry it was in school college industry energy meter condition .
- report reason crime the lecture senior trade no trainer generator power training panel wiring outcome and introduction wiring system wiring fundamental wiring process wiring project design way and component in transcript sheet was not marking exampt draw sheet construct electrical career electrician I'd saqa take electrical trade theory module wiring ways premise industrial electry wirings welding plumbing elecy wiring exam tools hand safety to safety .
- only refund switch wire electrotech electdotechnt symbol commisiony EIC code in dtic industries and society development after draw architecture the revise refund money money resale draw landscape the lowyer security safety policy accountability was non complit only dtic accoutability works place report ..
- report incidence date time close tendered CDs central supplies bid jhb report incidence dhet entry number Sita report incidence ..
- reference no : inc000252777051
- summary request assistance from Dept of high educaty and training
- the Nationals qualicafition framework (NQF) act 67 of 2008 mandates saqa to provides a foreign qualification evaluation and advisory service with it does in accordance with the policy and criteria of evaluation foreign

qualicafition within the south African NQF as amended March 2017 section (a) of policy and criteria stipulates the requirements that a foreign award instituts must meet for it qualicafition to be recognised ..
- Cass 24031110003192 tracking ID
-statisctic report criminel academic report guard number attandance number complain number probability investigate ruling static point pin static pin guard brigade fault find guard move frequet period cycle ,ecartype guard posting faculty name time occurence guard action take complat time hour ,transcript date time homewy docket document hours entry exhibiy course investigate historigram equation time going framework point action station equation move site develoy system close low remark result outcome event investigate event visual studio deployment team time show coordination X,y map show graphical name bridge address bridge complain point equation co-ordinate matrics line complain histogramme

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Curriculum section 3

3.1

Thesis. Degree honour, council quality rules low become justice development court and labour relations counciliation mediation, Engineering electrical trade research policy skill ,safety security order developm ,defense order

- - manufacture specifications,
site plan
- ,manufacture
- compagny standai and customer.
- requirements.
- date completed trainer signature apprentice. Install ,maint and troublest fire alarm ,system to provide all necesst interconnection supply ,signal wiring ,detection wiring,door monitoring,fsn air control ,elevator homing ,s prinkler detection ,monitor raceway wiring ,voice communication ,system in accory with standard,,,
- installing and test community system components by and device : provided test and verificayv site plan manufacture instructy ,
- date completed ..trainer apprenticeship b,,Audi visual system instsjk,,

- communication system all interconnection such supply ,signal wiring ,detection wiring and entry exit monitoring by installn,testing wiring system components of clock system testing verifit ,,
- constructy maintent electrician ,select maintain operate test and measuring , equipment general perfot .
- objective: maintance and operate test and messy equipment by laying out and installing power and energy metering by laying out installing power and energy metering equipment,selecting operate maintain insulation ,tester ,selecting operating and maintay oscilloscope selecting ,operating and mainy high voltage computer based test eqyit selecting operating , operationel fault locator ,selecting operating high voltage test equipment ,selecting ,operating chart record ,test eqyit ,operating and maintenance special soecisj test,power and energy metering equipment includy,device ground fault sensor ,static voltage ,regulator and remote field device maintain design criteria ,select operate and maint snslogb difitsj,,select operate oscilloscope ensure is correct operationej ,chard code ensure is correct in accordat,,control system instrument measure ensure is correct performance..select installation testing equipment ,calibratt procedure ,type wiring network and verit proceduy.
* Writing a job docut communicay in the workplace instruction presented image ..job work include work order ,change order ,office memotendu,letter accident report for ,ensuru that documy are wiri clearly legibility and completi .in accordance ..listen to customer relation by listet attentively to custyvand co workers , explain v using verbal non verbal problem and procedure identified , compagny policy and procedyb.

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to
me

-overview: qualicafition framework and council occupation skill outcome base Val ..
Assememt outcome base and moderator,:
-level provide a pathway for learner to understand assessment and if required qualifications as an assessor , learner who wish to achit these units could be assessing competence or non competence base learning , knowledge or skill ,they will select the units and quality that meet the requirements of wath they are assessing.
- level master degree honour bachelor undergraduate diploma certifiy ,use ,,level 1,23,4,5,6,7,8,9 award in understanding the principles

and practice of assessment is a knowledge only award for those who are starting their journey as an assessor pratice but are not currently practicing ..
- the level1,2, 3,4,5,6,7,8,8 award in assessing competence in the work envt is for practitioner who the assesst the demonstrate of competence in the work enviy using the fy.assessment method observations examing g work product oral questioning and discussion use of witny learner statement , recognition of prior learning .
- level 1,2,3,4,5,6,7,8,9, award in assessing vocatt relate achievey is for pratictioners who's assess knowledge and or skills vocationally related subject area using ,assessmy ,written questions , assignment project case studies RPL .
- full details
Level 3 award in understanding the princi..
- accreditation number:
- type credit base qualicafition.:
- credit :
-Guided learning hours : 24-
- total qualifications time :
- last certificate

- Overview: asssessment engineering system division : modelling and assesment for policy:
Course home,sylabt,calendar, reading,lecture note project , and example ,assignt ,
*Key: modeling and assessessment for policy explore how science information and quantitative models can be used go inform policy decissy making student will develop an understanding of quantitative modeling techniques and their roles in the policy process throuse case studies and interactive activities .
- the course address issue such as analysis of scientific assessessment process ,used such as analysis of science assessessment processes,uses of integrated assessessment models ,public perception of quantitative infot methods for dealing with uncertainties and design choice in buildut policy relevant models examples used in this class focus on models and information used in earth system in .system..
*Find by topics , find course number ,find delart,audio video ,online textt,new course ,most visit course ,scholar course , course MIT, supplemtaire resource ,translate course..
,about open course ware ,site stars ,media ,press releases
--model eny system diviy ; modeling and assessessment policy assignment b..

_____
- topics | Materials
_problem visited to the museum science.
- making model exhibit
- problem set: risk assessment models.
-risk assessessment model : student.
- problem set : applying framework to Cass studies.
- rains modeling of country posity .
- lrtao simulat exert instruct .
- problem set 5 : chemiy exercise.
* Problt sstt ,due session, risk assessment models your assignt is to create a framework for a risk asst process , continuing consider the work that the process Egan session ..
Ref : 6 lecture notes on
- assessessment model diagram to address some asssessment model diagram bto address criticit of the modej construct.diagram to facilitate generalizable detail ..
-; drawing model and submit it one a have diffet or 2 questions power point , questions b model improvement in these area ,orga health risk asst toolkit ..
- documents.
- prepare .answer following review critique , asst ,wath are revise appriat to rush ,recommy , ..
- sessions : apply framework to Cass studies assignment will allow you to practice applying the analyse framework. Coverage si far case studies of modeling and asst for policy for assigmi ,choose a sxuentift assesment process relevant to decissy taking you may choose a process relevant to decission interested of cases we mentioned or read about in class ,
- describe your case :
- wath is the decissy process involved ,wath is the role for science or technical ..
- process salient credible and legitimately to that decissy maker stakeholders why reflect framework .
-was an adaptive managey approat take at any time during the assessessment and make decisions process ,if so descry choose your own Cass please provide citation bibliography where appy in your answer if case specify informed from your answer experiemental or some persy.
- problem ,due ,quest modeling country position develop a shirt position papper the ,the lositt ,a consist start ,negot outcome write a press release annout the outcoy of negotiations ,summarise the Free upon outcome and commit ,identify outcoy is good or ,
- questions ,reflect having negotiation process, ..
- wath are beneficial and limitations of sing ..
-

- country in the negotiations thought on persons role of lrtao chose negott whatever outcom you which , used issue of acidifit ,germat country in emissions years 1981 for the sake sovit union and Czechoslovakia ,
- modeling and assesment for policy , Noelle ..
- 1 introducty : who are we teach staff v proff noejj v dr Frank field ,our roles and rest introducty : who are you name programme ,sentence on resea..

Thesis topics / interested introduction.

- what the problem v s different view on science and policy .
- someone once said ,Ll model are wrong ,some model are useful syllabus overview on science objective course ,vs learn help to identify best practices .in using scientify information in the policy process vs idenstifucstons pillar assessment bvs understand issues such uncery communication vs and how to conceptualize police through the term manage issue in policy on decission b, scientify b term vs syllabus overview vs using experiemental bshould be take vs grad student bmaster or ph d levej vs open to background bin natural bscience entb.. quantitative bcv some some science to background b..
- challenge wath science poursuit vs complex communicate social contract vs adres socisj need communication vvs fundamental bresesrcg multi schales , management bvs train interdisciplinary scientist vs improvement
- process post normal science contrast normaj vs normal science following shift high decissy stakes extend peer communication ..

- key to acing the police assessessment center examination b: candidate vjob selecting meNs , skill told sort about preparing for the assessment advice yourself . Faced your success the center you begit better.
-;study assesment center process : absolutely nothing in article the need of benefits or througly learning about the assesment center process your Xue to get online find quality book about police assessessment .

Assesment center have task to I completed task include presenting and oral resume an in basket exercise vhandling reading about the process depth task ..

- read books on leadership and management: undersy concept and using the rigth lingi is impory ground running promoting about asssessment b..
- prepare oral resume and pratice pratice assessessment center requirements you tell the assessessment b.aboutbmeans give oral resume . interview segment bof the assessment .a common mistake believe that you tell people about your self ..

- prepare for specific scenario ..critical incidence types scenario to practice writing and talking about active shooter call at school overturned .
- prepare for the interview questions : assessor will interview candidat each same auestt prepare wuestu ..

-overview : police management information system survey in Canada police force recently becomes,
General design quantity information component a output report and file inter action , the titles . Implementating.. technologie .. design process issue , management infory system ,record central statistic record
- law enforcement record system , description file name , database format ,case geofile maintence geofile used validate,reporting area x,y,z coordinator information cross ..geofile geography information basis communication coordinator creation configuration b, juvenile default age .. property flagged with adequate warning to prevent inadvertently damage law enforcement b,,
- use case diagram interfaces information RMS an incidence number close location access and possible update variety local system ,court prosecutor final human resource system and multujurisdusctiin information ..data exchanges ..
- standard function specification for law enforcement record system ..missio n standard low enforcy RMS sucessded ..agency. ..
- service , department of motor ,vehicle , transformser drives under the influence transmission ,
- specific FBI bureaux .
- model health insurance..
- council mobili data ,master location master identified,master vehicle ,national crime ..
- execuy protection ,open datat,connectivity office justice ,program , identified ,police , proposal regiony information ,
- manager system .
- operating procedure ,number ,,law ..
- real time crime record managet system for national security :
* Respective police police officer upload the data about ,wanted person , suspect person upload data , ..
*Advau of police system for developing countries : advantat for e government the police countries public accessible ,police system ,diary smsv,
- security communication since whole police interconnection as wide area wan topologies..
- crime reduction it possible to reduce any type of crime any section of country ..
- safety and securt incretion : for country and country citizen safety any kinds of the section our system ..

- standandar in order making the countries police admission world..esaeny.normak police system..
- software design for e police system :
Methodology : if we want to develop software we need to follow , being procedure ,name pin ,user DV feature match. Software development life cycle ,
- entity relation diagrams and context diagram .
- entity relation can express structure of database .
- diagram of our system ,
- data flow diagram for S- police system .
- data flow diagram for .data flow diagram concerned with understand the concerned with understand the processing with an organizatt the rekationsu .
- process graphically betweg external entire and process data store ,
Dfd
Level:
System invLide
- police form.
- complain
- form valid complain for valid
- form form fill up
- completed .
- invzlide form seriaj .
- invalid
- police I'd complain .
- test valid complain valid ID received ..
- electronics device .
- software special branches
- criminals record software vendor .media telecommunication n list too terrorist list custody list criminal injure
-;infrasybof an police system step challenge b implementation b.forbsoftware ..java my SQL ,,general police.. government bservicebrecitd case stolen carb criminsj ..
- installatt of locak area netwit lab at diffet location includy police station centre police office ,traffic police ,traffic monitory station ,prison ,,installer metropolitan area .
- secure internet access for police station cover
- establiy data centre for hosting web ..
- Deve.
- establiy of cyber crime detention cell development cyber law regulation framework ,scanning of reviouse record police station ,prison traffic data ,,
-:installation ,configuy and training. Of netwirt device of networking bsystem administration b..
- maintenance and support by vendor onnetwiry equipment blikr firewalls IDs ,ssitchbneywirj sensor police issuev perspective bdeveloing countries challenge related to impletation following bare face during implementating

be police system .
- inadequate information and communicate technology with government as well across nationb..
- inadequate access to information police personej and by citizev
- lack of awareness of police personal and citizen ..
- lack of adequate training countries ,non acceptability of information and community .
- lack of incentive structure for police personej Nd government official-
- technoy necessary regulation legal framework .
- valide complain
Form
- stop service .
- check criminal I'd
- deliver service
- stop service

- RSA police training basic ..
* Introduction
Research procedure evaluaty . Form basic ,racial ,accomoday Nd facilitation , recruitment capacity ,basic culture .
- teaching learning and assessessment .
- course structure and content curriculum,academic training ,assesment problem area the impact discipline .
- mode orientation list register books form general usage schematic presentation.
- pocket book ,
- occurrence book
- detention of suspect detaining of suspects .
- admisst of guilt .
- crime register .
- property of prisioners.
- body search ,safe custody and treatment accused.
- cell register.
- exhib register .
- relief commander report.
- duties of charge officer commander .
- fits information of crime .
- statement.
- correspondence no.
- methods of obtaining the presence of an accused in court .
- scene of crime .
- arrest Nd the implemy of judges .

,- finger prints .
- road traffic accident report

- plan draugthing
- giving evidey .
- circulation and cancellation of property and missing person ..
-*
Welcoming and orientation description of crime conduct as ekemt of crime unlawfulbesd
- criminsj accountability b.
,- juvenility .men culpability intention negligey..
- murder: definition and intention .
- culpablf homicide : definition ..
Assault : definition ,element ,unlawfulbesd and intention .
- crime injurs : definition ,conduct ,unlawfuness ,factor crime ..
- pointing of a fire arm : definition unlawfulbesd.
-;rapt ,theft .

- Ribery and exortorsion
 -;arson ,bridery defeating course of justice .
- contempt court ..

* Criminals Law
- liquor act definition restricted point closed days ,supply liquor to juvenile rigthnof administration nptemisse ..
- dependance producing substance ..
Sexual offences ,brothel unlaev,sexuel youth ,idiot imbecile..
- dangerouse weapons act ,defbcomon lowv declaration
- arms ammnuy act : definition bpossesion weapon throgth license authority ..
- trspass act : prohibition entering or presence upon property land .
- act prot ..
- house breaking with intent to commit a crime..
- statutory .
- the child care act : removal of certain children to replace safety neglected child
- inquest act : investigation into circustat.
-rosf traffic act ,duty of driver in event of accident reckler negligent incosiderating ..
- * criminal procedure :
Schedule I offence methods securing attandance of accused in court manner and effect arrest.
- arrest by police officer without warrentv,civilllis force entry into premise for purpose for arrest .
- use force in effecting an arrest used of fire arm by member of the force ,s 9252 ,video force.

- escaping aiding escaoe submitted bname address search search and seizure of article statement ,may seize article ,stats seuzs certain article ..
- search warenu search without search warrant entry of premise for put of obtaining evidence resistance against entry or search unlawful search .
Scgeduj parent guardu juveny .
- general law amendmt act ,62/1955.failure in giving a full account possession abscent reasonable article legally .
- orientsy :
- establiy of rdnsa saps structure ..
- other police force in s in relafy force reservist and police ,different to whalifiev.
- benefit for member of the force aid schemes.
- policing , coercisr action certain sort safeguy society legislation provist and activities .
- goaj policing objective population more people cause more crime interaction between people communication
- partenship in policing .
- police community relat.
- public attitude class duscuy.clsdf indirect contact .
- direct contact plan action .
- the benefit good police ,community relay .class discut .
- dealing with a complain in case rape misconception regard raor ,effect rape of victims .dealing with rape victim,factor that may influt,
- case that are reported at charge office ,Cass that junior police office must of necesst deajt with himself .work assigntbfed cladd discussed b.videu.
- disciplinary order .
Complaint against police by member of the public .
- repugnant remarks.politiczl discussion ,afremmdt between news papier press ,Deb ,gambling smoke drunkrs intemperate habits complain and redress of wrong .,
- police community : crime orevet ,crime ,eleminatiin opport the role police prevei and role of indtution prevention of crime prevey Bilitu patrol.
- civil claim against state .unlawvact perfot in the line duty .
- civil against state .
- the pricipl giving of giving evidence : the effect fear in the witness stand knowledge of the legal asoec behai ,..
- dialogt and negotiation skills.
 Humain rigth
- s police code conduct .
- professy .
- management of charge : daily conduct by member in face police change ..
------;-

-police acts regulation
the function sa police power and Durie member of the force .
- employment of the force in time of emergency limitations of rigth resign .
- contravention member of force .
- dismissal ,discharge ,or reduction in rank of non commissioned members force summary dismissal .
- prohbii on certain dealing in certain article unlawful receiving possession of property belonging to the force ..
- reward for extraordinary dillingencr or exertion falsek pretending bto be membt ..
- wearing of unigftb badge interference bwith member of the force..
_ regulation : interpretation of term superior day off .
- member to place all their time the disposal state regb..
- vaccination inoculation marriage and family change ..
- leave of absence.
Granting of leave
Granting of suck leave .
- offence against duty and disciplined.
- trisk by commisst officer under section section appeal against conviction and sentence and review .
- liabilt for deficient loss ,demage ,or expense and recover thereof residence address and telephone number quaetes.
- standing orders stores ,room inventt ,personal equipment sheet .
- building site and ayaters fires armsv ammunition.
- standany .
- special force order general : interpret of term motor vehicle ,police motor vehicle accidents ..
- use of governy owned vehicle ,office purpose ,conveyance immediately household ,towing vehicle ,traffic law and regulations b.
- counter and considerate driving ,safe custody unautht used of govermy owner vehicle.
- forfeiture of state protection .
- reporting and investigat of collision .
- conveyance of prison .
- loos object article..
_____&&
*Municit police unit .:
Structure ,function ,activities ,duties and regulations , examination assign Orientation role of chaplain ,introduction police ethic ,belied resoectb,class discut ,respect for calling ,resoectbmarisgebrespectbfir property , respect for country and culture..

_____
Musketry ;
Care maintenance :.
9mm Beretta pistol,
- 9 mm Walther P38

- 9mm Z 88 browsning shotguy.
Beretta 200 ,22 bore shotgun
- breta 202,1$ bore shotgun .
- Walther HMC ,
- R # rifle .
- test .
- first aid .
- shooting range ,shotgun and HMC.
- shooting range pistol ..
*

____
Foot drikk
- salute ,showing respect,sectional drikk ,rifle still,ceremoniak drikk ,drill for inspect .

_____
Physical education
Free standing exercise ,fixing ,tonfka ,wrestling ,lifesaving ,fitness,self defence

'
____
Cid Education .
- admint :
- duty ,goal and function of the Cid ..
The principle of giving evidey .
- theory .,theft roberty,housebreat and theft ,mutderv.
- guideline handling complain ..
- crime investv,the CRS duties ,video ,akternattv,scene of crime ,

_____
Theory, pratical bicke theft ,searching ,feddbat and discussion..
- evidet collectt and control ,
- statement : theory ,praticK home assignment .
- informers : theory ,pursuit ,claim for informers and completing of claim forms ,
* Power of arresting person : power search .
* Interesview :
Type of interviy ,interogay ,rigth to interrogation,rigth of accused ,preparau for intervy ,judge rules ,admnision ,confesst ,pointagd out ,
-- indetificatiin parade theory ,praticakb,
,- finger prints theory praticaj .
-:case docket ,purpose and layout ,investiy diary reason for it used and complain .
-:case control register and Cass book ,handing over , inspection purpose of and certificate ,disposal of exhibits ,responsibiy before completion .
- * relationship with prosecut ,bauk reactive policing,globJ vie of security situatt ,movement control ,crime information coordinating csntrev,
- scene crime house break .autopsy ,theory wath involves ways of

conduct ,documy register identificay,use of decided cases ,pratice of passing out parade ,
* Administrative: leave ,sick leave,leave for study ,exam purpose maternity leave ,
* Filliy system ,usage and dispoy of archive ,personal document .officit correspondat ,minute ,application application report ,board inauiry ,completing , statement by with..
* Introduction to computer trait .
- goverment owner vehicle .
- collision ,management ..promoy,logistt admnistratv,logistic ..financial admnistray ,different claim ,receiving ,hanling of money ,remission register .
- pratice for passing out parade ..
*___&_&
Visual policing :
2. Patrol: .
Phylosophie of patrols
- management maintenance of governy owned vehicle ,f0 ,G ,3 A / 1987..
- management and maintenance of gov
- attending to complain
- reaction time .
- general action toward complain with ref complain ieb assault theft housebreak ,stick theft ,reckless ,negligent driver no collision.
- power of arrest and search .
- his lawful arrest is Ffecfed
- rigth of arrested person legal assistance .
- attending , handling house molest famyy squabbles Bd action the scene ..
- road traffic collision .culpables homicide ,seriousd injuries ,information by investgaty ,plant correct filling out forms ..
- driver influence of liquor .
- roadblock and searching of vehicle occupants ..
- searching of builduy premises.
- action ,conduct at scene of fire serious crime Nd the preserving of the scent..
- arrest ,application of judge rules by member first , on scene ,admisst confesst ,exhibtd ..
- testifying Nd conduct in court ,video ,duties court ordely ,
- priority ,setting of goak ,times managemy ,
- crime prevey and prevent power .brie community,taking down repeating of repirf ,
,- radii ,radio control ,speech procedure
Passing out parade.

..
* Time table : sjs
Monday |

Time ,o7: 29 to 16h..
- skikk area covered in metropolitan police training materials.
Communication

* Verbal | non verb | listening
Voice volume ,intonatii. ,word soecefs vocabulaire b,,€€ body position ,touch ,eye contact gesture ,/)) listening encouragt ,gesture , summarise b,eyes contact..
__'
Investigation :
- question tech • enquiring approach |€™ use of infort .
,- logistical seauenct ,variety style open ,probes ,summarise ,links ,,|€ check and confirm ,maintain open mind ,question fault ,
Use infirmatt , use all
Physic finess
..

* overview : electronics and electrical ent ,technology research police ..
Information management system
- introduction :
,- financial programmes :
- administration
- information used to generated performance information or predetermine ..
* Objective :
- technical indicators description and information
- information system used to generate performance information on predetermined .
- technical indicators description and information ..
- flow ,subprogram me : crime preventt.
- subprogramme ,border security
- programme detective service..
Investigation.
- criminal record centre .
- forensic ..
* Programme crime intelligence : information system used to generated performance information on predetermined objective:
- technical indicators description and information .
- crime intelligence operations.
* Intelligent and information management .
* Protection and security : informed use to generate performance

information objective ..technical indicator description information .
- protection security .
* Vip protection .

* Static protection .
- government security regulator
- presidential protection
- physical security admnistrat system tidy technical indicators .
Technology many ,provisioning plan , important person vispol visibility ,
* State perfot transform and professional the service number of internship undertaker manuej system .
-;name system descrupt Manuel ,
Internship and advertise ..
Human resource personality police persak ,salary , function integrated humain
Independent police ,indicator system ,,
-:percentat of discipline case finalised Manuel register name system :
- excell spread sheet capture data regart disciplinary case finalised and pending :
- work reporting is based on approved project plt project information ,police financial ,polfib
- work control system : maintained departt of public work planned
- system name system .
- descrptt approved project plan .
- saps project and polfib
- saps system many police facility project office ,information progress .
 - template must line strategic plan objective , project execution plan .report document information terminal .
- scope of work :
- building projects current finant years outer
- indicator provide the number of new mobile community service in rural and other area ,
- purpose : importance .
Service center deploy in ruraj and other remote area in order for policing .
- new indicator .
- new indicate output source .
- support evidence for quarter Lt annual reporting provision administration system.
- calculation type cumulay method of calculation ,
Actuaj number of mobile community service center distributed at the end of the current financial years ,data limitatt .report .cycle quartly and annually desired perfot , mobile point reporting. Responsibility division supply chain management impletation b.
- responsibility component head : vehicle management official directive
* Guidi and instruct contract ,date 2916-19-13 specifications service centre CSC build on a chassis cab truct spec 3123/2016 date indicator title

indentifi clandestine laboratories indicator ,criminal grouo create clandestine laboratv,illicite chemical equipment creation b.
- purpose : important organisation crime syndicate involvement supply drug new indicator type indicator ,outsource ,document audit
 ,case docket: enquire files ,database system used for processing and reporting perfot information manual independent database , system support evidence .. manual idependy database GACS ,
- system supporting evidy f..
- data incident report capture on database ,calculation type cumulative methods of calculative methods of ,, laboratory..
- report reporting cycle quartly and annually desired perfou ,100% ,29 reporting responsibility director for priority crime invest implemt responsibtb.directorst implement responsibility official directive instructybsaos amendtv,act 2012 ,act n ,20 of 2012 non proliferation of weapons of mass desteuctt act ,1993 ,act 87 of 1993:.

_____
Overview framework policing , qualifications core and elective component award learner ,248 credits , fundamental component consist of units standard to value of credit 56;
*Training and dt 52 credit police : to advice and counsel learners .
- facilitator in complex situat to create learning and growth .
- conduct moderation outcome based assesment

*Resolving of crime investt credit : conduct and investigat
-, handle suspect in the investigation of all
ege crime
-,admnise case ,
-present evidence in court
- * dog handling ,select dog in service work training ,move tactt with a service service ,conduct a human scent identification trail humain scent identification.utilize search and rescue dog in structure scenario to locate missing person and evidence ..
* Forensic s : demonstrate , and understanding of forensic sciet .
- demonstrate and understat the specialized field forensic .
- assimilation and present specialized evidence in court of law ..
- demonstrt knowt of temperature calibratt .
- develop : elementary calibrat system for reference weights balance pipet balance pipettes .
- demonstrate understanding of criminal justt..
* System : implet basic safety procedure in emergencies .
- perseve evidence on a scene ..
* Industrial relation : analyse complain and report relating to reffered dispute and select appropriate resolution process ..
- demonstrate and apply understand of basic conditit employee .
- demonstrate and apply an understat respon to collective ,agreemt and bargat council ,interpret apply collective agreements.

* Bomb disposal:
Identify and explain explosives .
- demonstrate an underst of the histot and the impact of explosive and explosion , conduct planing briefing and debriefy session , identify and explain explosives ordancd ,identify and explosive ,
- protection services : compile a threat and risk design person ,
- provide static protection of design person.
- provide close protection to designated person whilst in transit .
- provide close protection to designated person whilst in transit .
- provide pedestrian escort to designated person within close protectt environment.
- apply advanced driving skills ,technique in defensive and offensive sutuation

*Career management :
Management indivy career ,
Apply business ,
-performance practices.
- monitor staff performance.
- mentor employ in the performy enhancement process .
- advice and counsel learners.
- apply basic human resource practices .

* Personeel management .
- manage the human resource of a mission .
- apply basic human resources pratical.
- monitor to well being of clients and personnel .

*Supply chain management :
- develop acquisition requirements to meet stakeholder .
- apply principle of supply chains in freigtg.
- admnised the loss management and civij claim process .
- develop functions soecisj for complex acqut..
* Communication service :
- formulate and co-ordinate goverment communication .
* Management communicat project .
- managemy communicay project .
- support and data communication equipment .
- developmt and present and integrated and present an integrated markett present an integrated marketing communicTy .comparing ..
* Criminalistisx : interpret forensic science information ,
-conduct prelimit investigy.
- demonstrate an underst of the field of finger printing .
- explain visual recording of scene incident .
,,- justify disclosure or non disclosure information in an ethical framework .
- assimilate and present specialized evidence in a court of law ..

.*understerding of the criminal justice system :
*Hostage negotiation : demonstrate an understanding hostage and suicide negociation .
- apply fundamy of hostage suicide and kidnappi negotiu.
- participate as hostage negotiator hostage negotiation team ..
* Border control :
- perform duties of a police official at Port of entry :
* Apply relevent legislation ,detect and identify places of concealment .
- profile and selected goal at Port entry .
- admnister and control movement of person and goas across internattat port..

_____
Criminal investigation principle
Administration and cimmunicat skill,
- information manat :
- manage system document information .
- service delivery .
- framework regulatory.
- crime scenes and incidents.
- investigay methods techincah ,vehicjd ,
- paralegal assistance legaj low crime traffic low.
- study material fire arm policing schookb

-

...

* area security surveillance, private security ,saps ,netropot,community police ,private investigator..,,detective service , instituts violence. ..

* Police officer entrance exam : office measure the basic skills police perfort test area Marg test grade bases
, interview why want to work police officer . Law enforcement v like any job , when evaluating answer insoirat .
- you care about public work as ,you doing enjoying ..
- addit police officer police m...

_____
* Introduction science police :
- section career orientation profile, Engineering duty maintenance :
- selection process / choose a career answers.
- question .

- career understand ..
Entbcader junior , wath career .fire ..
Making detective ,unterd ..
...

*key department program detective.
*,crime intelligence , protection security ,resource consideration,risk , long term infrastructure and other capital plans , term infrasy and capital assets plan ,information and communy technologie,human resource development ,service delivery improvement , strategies overview, to creavsafe mission mission to prevent combat crime that may threaten safety and security of communiti ,investigate any to prevent and combat crime , ensure vthe offender are brought to justice ..
- participate in effort to address cause of crime .
* Code of conduct :
- particpt in all endeavour aimed address root cause of crime ,
- preventing LL act that threaten safety or security of any community .
- investigating criminal conduct that endager the safety .bdiga constitution low ,:
Act in rendering effective high standard that evry body and continuously strive towards improving service n
Utilise my own risk contribute .
- courthouse that impartial ..
- constitut mandate sOs section 205 .
Objective : prevent combat investigate crime ,maintain order ,protect security..
- minster police responsibiy for determining national , in relation saps act 1995 act ,68 of 1995 ..
- fire arm control ,dangerouse weapons ,national key pint act ,second hand good ,private security indut regulation ,act 2991 act intimidating ,game theft ,, independent police investigation directorate , civilian secretarial for police..
Crime service independent.cpfv

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Goal .. researche monitoring
Into by national commissioner RSA ,
Strategic ,vision ,mission ,code conduct ,legislt ,constituy ,policy mandate , situations , performance snvirot , organisation environment,the strategic planning process , strategies plan ,,outcome procedure ..
* Criminal justice degree : buchellor level overvit of criminel system students learn about segment topics evidence of legal counsel coursework.

- criminolt ,the juvenile justice security and policy ,intro to law and correction .
* Police studies and law enforcement degrees : these types are prevalent offered certificate bachelor's b history police system v.
American policing, probation and parole,intro to criminal justt , contemporary police ,stragies ,
- student on line participate communication police
.
Online peace certificate undergraduate program in criminsj justice police studies and law enforcement ,,
-* police science and law enforcement vpubkic criminal prepare career file report..
- education information : relevant program found associate bachelor master and doctoral degree in law ent criminal justice enforcement and ,certificate program program combine physical demande variety course ,in criminology and law psychopedagogie associate degree ,administrative roles in law , master degrees ,
-assiciate degree in law enforcement ,bachelor's degree law enforcement ,bachelor degree in police science .
- master degree in criminal justt top science degree law enforcement ..
* Distance learning police officer want further training ,associate degree in police on line ,bachelor degree police on linrv..
-*overview :policing fundamental course : introduction police familiarise students with responsibility of police officer howv operate in criminal justice legaj issues regarding police officer roles studies exam constitution the penah system and procedure ,steps for police patrolling and overview of they look when patrolling bare discussed bhired or sponsored b..
* Crime prevention course : in a criminal course future officer become familiar b investigat address need student examine ,security structure and response include commercial vretail discussed class students learn about peepetrtvrigtg ,
* Crime analyse course : student learn determiner type crime committed methods by student commited collecting evidence and analizing data studies learn how to predict and anticiot future criminal ,crimes process technical proposrectuvdv police office read case studies lecture and study crimes updates and study .update technilogie and tools in police fieldwork ..
* Counter intelligence course: intermediate to advanced address's ways information is gathers counter response are developt ways to use the context of protecting ..
* Law ..
- on line

..

*on line degrees : online peace officer certification information ,classes

course police ,forensic nurse examination ,course and classes ..
* Salaries and outlook : border patrol officer salaries info.
- duties and requirements ,salary info for master in forensic psychology:
-:career information:
Court bailiff : job duty requirements for becoming a court baliff :
- deputy sheet job outlook career ..
- school with cybercrime program studies detaikk Sherriff ...* Police cybercry studies detailed deputy sheet course classes trainubgb..
Peace officer planing pursuing law enforcement career can study criminsj orvlas prepare police academic.

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*:forensic science laboratory.
Any laboratory Durie ,preparing the specimen,calibrating of scientific , fragments analysis ,quality ,quality ,quality ,armored ..
Forensic science in the application of science : method in investigat of criminel and specially exam material forensic derive ,, biology ,chemistry and electronics , units new built complex was occupy ballist question unit ,sa criminal bureau ,200 a decision b. Law
- ballistic unit : functt unite : rendering of effective service ,unit responsible examination fire arm and tools marks etching process are applied to restore number which have been .
The majority of examony ,conducted by the ballisty fall into three .
- internal forensic ballist ,external ballistic ,terminal forensic ,
The examinatt particyli in case alleged accidental discharge ,of fire arm and their mechanism to determine possible defect .examinatt of homemade instruments .
- miscellaneous firearm to determine whether or not they comply description definition actv,75 of 75 of #969..
- determine of calibration type of ammunition.
- identification of small ,arm ammut.
- determine of the possibly type weapon from which suspect bullet or cartridge CAS was fired..
- microscopic comparison of bullet fired as well as cartrt Cass to detert wether or not the we fired from the fire in case particut in case was ,used .
- the individuals of fired bullet and cartridges fire was used at more than one crime scenario .
- determine of type of calibre or projectile determine b.
Miscellaneous;

_____
-* scientific analysis unit :
Function:
Rendering of an effective forensics analysis service principle physic .a variety organic and inorganic matter or substance in analizing at scientific analysis unit ,typical ,organic matter platisc , synthesis fiver fuel and vefett medecinf prison inorganic matter include soil ,gold metal and primer

residue..
* Physical matches::when two more piece of a broken object physically fit together to form unit physic ..
- paint : variation colour formulation and use paint make it physical exhibith with decission evidence play important role in case run collision vehicle and n which force was used to enter premise or a safe..
- soil : owing to its nature ,soik is readily transferable to item of clothing motor vehicles bthis transfers soik gratt as evidence in the analyse soik colour particle size mineralogy organic composiy of great importance in the investigation of Cass..
- filaments : examine of filaments of lights healigth ,brakr ligth ,tail ligth and indicator ligth in vehicle ligth collision can determine whether ligth of the vehicle concerned were switch on during accident.
- glass : is often found on clothing and.usefull evidence determine physical mstx ..
- metallurgy : field focuses on the characteristics of metal and other materials such as ceramic investigation : determine of cause of faillt of material by surface of fracture .
- analyse of metals for confirmation to specifications..
- analyse of the surface ..
- coins jewellery and precioy stones metal , in order diamond rubies emerlard examine to determine whether genuine metal ruthenium, rhodium,,diverse analyse ,chemical analyse non
performed ..laboratory ,alcohol quantity liquor illegaj sake..
- any divers chemical analysis chemiy brake ,fluid ,oils ,glues ,adhesive ..
* Electronic : examination
 video cassette analysis ,audio cassette analyser,magnetic ,scenario electric electronics ,electrical ,electrocution ,crime related to computer,data retrieval , copyright on program,computer hardy,softy,voicev, comparison individual..
* Polygraph components : detector polygraph used detect any deviations in for example b..
* Question document unit :
Function : handwriting ,indivualuzattion compare present writing dispute document those person wether person documents bcass unambiguous.
- typewriting ,a typewriting or printed documents indivualuzattion as the,product specify.errasur obliterated insertion overwintering on documybe detected and writing be restored.
Forged signature and tracing of signatt can be determiy.
- bass material oapoer material ,used base for the composition documents can examination to reveal wether type manufacture..link other medium document .. apparatus stamps prints press ..
Damage ..USA dollars bank note are examined review authentic printers plate colours laser copies ..
* Bioloy unit : rendering of an effective biology unit responsible analyse of evidenti material biologi oring , body fluid tissue off degree identificatt DNA

analyse microscot evident value ,DNA exhibition ..
- trichology : microscopic observt structural similt hairs found the scene crime to control .reveaj body ..
- scene invest support : components attend ,investigate crime scene biological natural performance anthropology investigate aimed,collect refer entimolot odontologie evidence perform mummifiej fingerprint and exhumation ,crime scene investt to collect evidence material further analyse la outside instuy and for purpose recobstryb anatomic entimologicv..
- chemistry unity ,: function rendering ,chemistry unity undertake analyse ..-
forenst : drug analyt drug orosecuy agenciy investt of drug. Related crime assistance.
- analyse substaupoweders pills liquids controller, thereof with substatbcontrik act determine stranding and investigat drug related crime scenes with laboratory trained staff are available to reconstruct ,compiling physical prolifer intelligence operations purpose..
- common drug routinely analysed .natural syntheyx .marhaqualom,canabid ,Mohs..
- fire arm explosion investigat : analyse exhibith material after explosion determine what type explosive was used.rendered technical assistance bomb dispot unit evaluating home built .
Event of suspect arson expert .
- attendt fire scenes and performing a detailed physical ..
Plant ..explosive unity

_____
**
Recruitment and appointment ,age
Be at least ,25 but under 40 tease document proofs ,completed health wuestyb,meducat mentsj ,be good and sound character .
- fit the psychometric profile and must successful completion bdns no criminal record ..
-
...

- state rendered supply a product to the saps ..involved private security industrial trade liquor,taxi
Private investigat service not limitation b private detey intercep communication ..
- member correctional : service duties reservist normaj ...
Re inlistment reserve member or reserved ..
- ranks :
- training and skills development .,
-to established a RSA judicial education institutime in order to promote the independent ,impartiality dignity accessibility and effect of the courts by providing judicial educati officer administration of affairs regultb....

*****
* Fire arm control and policy :
Summary : RSA FC framework bimpose procedure requirements for obtaining ,competency ,license ,permit , authorisation to losses a fire arm to deal in fire arm or to carry activities inckud running fire training enterprise ..
- introduction: RSA comphrt fire arm control regulatory regimnin place subsidy contruj law ammuntb.
Saps ..
* Definit of firearm : adopt broad defint ..
* Rigth to posses firearm : full automatic , gun cannon recoills fun ,mortar ligth manufacture ,grenadev..
- projectile : rickdf manufacture ,
,- limitation ..
* Competency certificate license permit authort and accredt .
* Accreditation : public collectt ..

* Competency certificate : trade manufacture license ,residence business ..
* License to posses fire arm : license posses self defense : registration issue license shotgun hand ,automai person is eligibmd to apply..

Private collection ...business proposal ..
Tempor authirizatiin ..
Termination of a fire arm licdbddv declare registrar finaj protect certain crime ..
- fire arm dealers : person trade ammunutuin. licensd...-
- safe custy of firearm : ..
- fire arm free zones : consuktatt ..
- offenses and penalties violenturs..

_____
* Fundamet compulsory subject :
-:* career paths : joins the saps ,traffic agencies militaire ,security private security manat .
- communaute.
- introduction to policing ..

: -_--
Career assessessment:

* What portion of the one million does Robert suspect need pay the bond ,,
* Select the word or phrase that most clearly means the same as the underlying world .
* When the suspect refused to open the door the police executed the search warrant took door off if it's hinges.

Broken dowv,presented,signed,carried out ,.
* Identify the missoet word in the follt sentence ..
* The surprisint news andmated the conversation amongst the group ' surprising ,andmated,conversat ,among .
* Solve the follot :
28-3(-5),, ..
* Cindy goes withdraw money fing from the ground floor jhon take and elevator ,@rom .balance account wath is the balance of her account ...
* start

_____

Insulator,over
* Graduated :

* Police service : motor ..
* Motor mechanic engitb
Core functt : performance quality and cost efft repairs and my of saps vehicle ensure a clean and safe envt diagnose and strip and determine the part require and repaired comoltet part request pee vehicle,completed job ,bricklatyhf trade check the quantity building : marerush of each site ,building fiundantuib you to fkijr levej plastering of specified walls accordt to plans building disabilt Ramos at all police ,station responsibility nfor demolition of facilit selected after complete of project usage and safeguat of all equipment material cleaning work environment..

- matric ncv levej ,plumbing ,n3: trade test :
Cored function trade test core functt plumbing duties obtain material for installation laybabd join pipes read and interpret sketch per request cleaning working environment busage and safeguards of all equipment material and ,apply occupt , ..
-:electrician internet infrastructure maintence service ..core interpret sketch per request ,performance electrical on activities,project obtain installation usage and cleaning of working environment...
- carpenters joints ,cabinet make ,infrasture maintenance ,,.- caroentrie : read interpretation sketch set operate woodworking v machine operator ..machine motise power ..wooden product..
- apply occupatt ..
- supply chain management :
Quantity : surveij ..provide cost estimates and cost advice prepare and compile contract documy and specification bid tendered financisj building project under execy..
- programme project

:
Engineering electrical
: core functions ,assist ensure technical compliance quality on constructy

maintat sites faculty prepare bidc insure implementating.

* Overview:Mine health and safety ,actv..:
- .
Objective.
- inspectorate mine health safety ,
Minister power
*..applied thermodynamics
Air and gas compressor and blower ..,air motor,compressed air ,receiver ,
refrigerator properties
Psychometric table chart..
Steam generator boiler ancillary equipment,
Properties steam .
- heat balancing .
- steam and gas turt.
- internal combustion engine.
- heat transfer.
- fuel and combustion.
* Structures and strencty of material:
Simple stress,
-;simple stress and strain.
- walled pressure.
- torsion of circular shafts
- shear force bending.strent ,second bending stress
- cTenaries.
- fatigue failure .
- mechanical chemical properties of metal .
- twisting of shafts .
- ropes. ,properties of different.
- types of roles.
- retaining concretv...
Insulator ,
Overhead line , economic power supply,
- maximum demand .circuit breaker.
- high frequency transient methods earthing.
- storage energy .
- fault discru.
- symmetrical fault communication ,lighting protection ....
- theory of machine conveyorv winding plant,double drum signlrb.ropr.
- ekevaty traction ,inertia ,displaced ,static and dynamic b bakancuyv..
-;conditioning sabs 10266 safe use operation and inspection of man
-; .belt homologation of respiy equipment.
- ventilation brattices Nd ducting ..
Explosive dust atmosphere or both ..
- DC power machinery for used in hazard area in mines ..
- the used of ligth metak in hazard location..

- installation inspection mainyenat of equipment used explosive atmoy.
- installatt include surface installations on mines ..
- installation inspection of equipment used in explosion ..
- electrical equipment installed underground.
- the installation inspection repairs and overhaul aooartus in explosive ..
- the classifiy of hazardy location selected of apparatus for use ..

- regulatory requirements explosibprotected .- worn escaoe type beatthinf ..
- circuit breathing apoaratt compressed oxygen or comprehensive oxygdv ..
-:code of practice for performance operation testing maintence ..
- gas measut equipmy primary ..
Battery operated flammables gas ..
- the measurements and assessessment occupational noise consert purpose sabs .

Electric initiation system shit explored based ..
- the safe application of detonator system for mining and civil blasting application .
- electronic detonator system .
- the safe application of detonator system for use in mining and civil ..
- gad measuring equipment primarily for use in mine .
- battery operated portable ,flammable gas measuring instruments warning device ..
- compliance mandatory code of practice ..
- the design erection use and inspection scaffot ..
- refriget system include plants
*'

...

- the new saqa certificate of evaluation back front ..
- the south African qualicafition authority ,saqa is Mandy in term of the NQF act ,57 of 2009, to .
Oversee the further development and implementation the national qualification framework NQF ,
- advance the objective the NQF and ..
- co- ordinate the three sub frameworks outline below .
* National qualification framework:
- sub framework qualifications type | level | |sub frameworks and quality type ..
.- high Education qualification sub framework HEQSF : doctoral degree doctoral degree professional level 10 ,

Master degree level 9,
Bachelor post .. level 8
Advanced. Level 7
Advanced. Level 6

High certificate ,occupation ..
* General and future educator :
National certificate :4
 intermediate certificate ,3 occupation certificate level 3
Elementary certificate ,
General certificate 1 : occupational certificate level..

_____
Management designation security manager :
* Generic management categie class of security
.skill programs | grad replace| unit standard || NQF levekv,credit
- generenercis management : explain the requirements for become a security service provider.,apply leader concept in work context gm4:,apply the organisation code of code conduct in work environment b,conduct structurak meeting ,employemat system approach .
- manage expenditure again a budget ,monitor the levek of service to range customer ,motivate ,priority , solve problem decission and umolent solution ,demonstrate basic understanding of primary labour legislation that impact on business unit..
- manager guard response assest transit in industr industries ,generic skikj must : demonstrate understanding of crime prevey ,conduct a security threat assessment in a defined operations area SSP ..
* Electronic skills programme installer : explain the requirements for becoming a security service esip , demonstrate knowledge of electrical safe working practices NC electronics ,apply cabling methods ,apply basic business ethic in work environment lock ,identify inspect use maintain and care for Engineering hand tools n c electrical ,select use and care for engit power hand tools lock ,use elementary electronics to electronics system , determine installation requirements ,explain the systems ,es,,sinstall electronics equipment b,install a basic radio transmiy and antenna system ,
* Electronics skill programme technician ,skill programme installer must be completed : configure installation ,assess threat for security installation purpose ,determine and rectify faults in an installation ,interpret Nd use inform text ,provide custt service ,accommodate audiancd and context ..
* Electronic skill programme cable : explain the requirements become a security ,demonstrate of electrical safe working practices electronics ,apply cabling method , apply basic business ethic work enviy..

* Electronics security industry monitoring interception device
* Electronics skikj programm elementary electronics as applied er instsjjd ,,: select use

,determit installation requirements ,explain the use installed system ,install electronics equipment b,provide customers service ,accommodate audiancd and context oraj signed communication..
* Electronic security industry ,X ray inspection metal detection and bomb detection : operate X ray screent equipment withing a security..
* Electronic security industry (fire detecty):
- electronics skill programme installer fire detecty ,skill progratcabler must be completed : select ,,explain installed install fire alarm and detection system ..
- electronics security industry alarm : system ..select used cars for Engineering power tools lock ,used element as applied to electronics system ,determine installatt requirements ,install electronics equipment ,provide custt ,acommot audiancd and context oraj sign communication ,install a basic radio transmitter and antenna system ,
- * alarm system : configure and installation ,assess threat for security installation purpose , determine and rectify fault in an installation ,interpret and use information ,,
* Electronic security ,access control system : installer control ,skill cabling : demonstrate and understand of electronics access control installer installer ,access control system
* Technician ..
* Electronic security indust designation ,electronics security officer : electronics security CCTV : installer CCTV , : demonstrate an understanding of CCTV ,installer close closed circuit Televsion ..

* Control room operator : designation control room shrveillat room operator :
Explain the requirements for becoming a security service provider ,operate effet with a specified control room envirt ,operate a computer workstation in business environment apply health .
- control room supervisor ,skikj programm control room operator must be completed : outline the legal environment of selected industry ,demonstrate basic underst of the primary labour left that ,supervise work unit to achieve work ,perform one one training on job ..
* Assets in transit sector : advisor consultant asset in transit sector ,Patrik officer access control protection officer skill program : outline the legal environment for a selected industry ,demonstrate underst of crime ,conduct a security threat assessment I. A definidy operai ,monitor assess of manager risk ..protect asest in transit ..
-* advisor consultant close protection officer : compile threat and risk assessment for close protectt operation ..
- close protection officer skill programme must be completed ....
- advisor consultant design security consukt. ..access control asset officer ,skill ...- advisor consultant response sector ..
- patrol officer access control officer ,asset protet skukj prograbb : Conduct security threat assessment in a defined operational area

coo ,monitor assess and risk ,provide security reasons service

...

* locksmith / safe technician :
Management lock smith safe technician : generic managemt skill programme must comply: apply health and safety to a work area lock .. grade. .
- gog handler trainer supplier : management dig handler trainer supplier ,generic mat: survive kennel practices ,care service digv...-management close protection industry generic skikj ,conplile a thread and risk assessment for close protection operation cpib demonstrate of the fire control act ,200 act no 69;200;
National cery : policing ,visibit police ,, safety security ..
..

* Safety precautions : caution CCTV .
Warning
Caution:
- technical parameters :
Pickup device : 1/4" Shari CCD , 1/3" Sony low illumt CCD ,
- number of pixels : Pak : 512(H)×582(v) NTSC : 512(H), 492..
- horizt resolution: 429 tiv,,
System of signal
Back compilation ,529
Electronic shutter : auto (@/50(169/69)_1/100000sex.
-AGC
- white balance : autib
S/N..
-gMma operational ,
- synch : internal .
- video output levejv: @.0 vob- / 75:

- waterproof coating ,
Lens .
- infrared ligth power input video output ....
_____

* Conduct asset in transit vehicle operation vehicle : law military and

security , sub field society safety ...
.
Prepare vehicle security equit and system for asses in transit protection operationel ,.

- manage transport of assets and crew during assesr in transit operationel v.
- operationel a security vehicle during emergencies situation .
- describing the procedure to return and store the assest in transit

_____

-;*conduct evacuay and emergency drills : security .
- fire identify and ases the emergency or safety sutuation :
Energy or safety sutuation : fire ,bomb, hazardous material , no.
Evacut ,partial evacuat ,full evacuation v, ,,
* Further education and training special security pratice ,
* Future education training certificate sociaj housing supervisor..
* National diploma v
* General education and training certificate transform .
* National certificate profest driving :,,
* Driver lives ,exam traffic traffic related goverment low,exam motor grade code ,,
* Transport and logit operationel ..
* Apply advanced driving skills ,defense driving : task team traffic : law ..
Apply advanced driving skills technique in defensive and offensive situatt : apply relates to vehicle dynat to reduce driving risk ,demonstrate technique use avoid accident and maintain control ,apply technique to improve driving skill...
* Further education and training certificate use of fire arms ,,
Explat apply support legist requirements in the training hand of fire arm ,, apply supervise technique with fire arm training ,select and fire training techniqt ,handle use fire in range of ..

* Road safety advice for foreigners driving in South Africa :
- overvit/ background information : ensure safe tourism road ..

- road infrastt / tool roads :
- rules of the road / traffic enft : drivers licences :
Regulation
- rules of the road :
- speed limit : general high freeway route 120 km/ h (75 mpg ,secondary rural ,build area ,69 kmh ..

_____
Defence intelligence :
Backgy: militairy skill development systet : defence intellectuel recruit ..
- minimy requirements : Pre emplu screeny psychometric testing and

security vetting ...

...

-*Overview:trafic : vehicle type and configuration are accurate indentified in accordance v, information is obtained in accordance with standard operational procedures relevant ,data veht load driver operate is capture in ,peemissiy masses are determinat in accordance with standard operation procedure and legislation ..
- the weigtt result are assessed in accordance with standard operational ..- driver and operator are identified accordance .with relevant ...- offences are identified in accordance with stand operational and legist.
- supporting is ..
- further education and certificate road traffic management..
- national certt policing.
The national road traffic regulatt section criminal procedure . dangerous load....
- sgb traffic ,related govermt law enforcement..
- further education and training , certificate road traffic many : ..
* Traffic signal starts : notice of defect : knowledge create duty , construction .
- risk management strategies.
- development of methods procedure.standars the investigation of new or alternative traffic signal ,over control function such as signak design layout data collt provide guit complex signal installat central control ..
- prepare and review traffic management plans include.
- professional engineering technology would normally involve ..the work signal division ,overall managemt .
- traffic data collection includes traffic ,speed saturation flow accident rate ,design , warranty studies for the installation of new traffic signal.
- priorisation .
- investigation into new installation.upgrading existing ...- developmt of method procedure ..
* Manpower and electronic..engi
-electricL and electronic engineering professional are those skill in electrical and electronics ..
Involve the usage digital electronics involved the use difitsj device ..advanced telecommunication and data transmitted,systet the installation maintenance and repair of which , normally not be necessary to involve , professional ent in the qualifications , profesionah Engineering ,line workers ,workers assistant , administration staff , qualicafition discipline of electric ,the repair workers of electrical electronics components v.

- workers will undertake task such lamp , replacement cleaning of lense paint post and alignment of signal a three grouo assisted worker..
Task of the electrical the electronics section.
- managemt supervision and control aspect related to electrical and electronics.
- management and control of personnel material Soares and tools ..
- keeping if record all activities and inventory control .
- budgeting for new installation maintenance.
- repair as well as controlling such budgets .
- installation maint and repair of all budge..
- installatt maintenat repair simple controller .
- management supervision and control of installation and maintenance..
- contract undertaker by private contactor ,
- inspection of installation during variouse stage of completion and final acceptance on contract ..completion .
- investigation into new development in the discipline of signalisatiin .
- providing advice to traffic engineering on the capabilities and limitation of traffic signal ,
- planning and implementation and upgrading programmes developing procedure ,
- for establishing maintenance under priority ..
* Control signaj installatt the utisatuin of area traffic ,system complexity traffic pattern well as skill levej of available personal ,levej of two authorities even if they control junction ..
- in terms of work hours per signalissd junctt or crossing the staffing levels .means the ..
That a person work hours per annum)1760 of no × level staffing..
* Appoint consulting engineers contractor ..
* Traffic engineering discipt manager ,professiot traffic engit..
- professy traffic engineering technot and technicit.
- electronics and electrical engineering.
- traffic engineering administrative staff.
- traffic foremen .qualified electrician , line workers ...
- traffic bsignaj ,road authority 299 signaj installation signaj ,and employ the full comolent engineers ..
* Operate with each other form a combit traffic signal division with of staff discussy above large road .
- operate and provide combine division the purpose ..
Where it is not possible to combine resource road controlling 59 signaj,less may utilise qualicafition .
- levet maintence authority ..
Road authorities controlling between 59 and 299 signal installation should emplemt measure that would ..

...

- implementating measure .
* Education and technology transfer : continue Education transfer of skills and knowledge to personal importance to ensure efficient and safe signaj operationel and allow personnel to of , ,,road authority must be aware of the levejs and skill necesst to perform the broad range of function requirements and the consequences of not provide the required .
- installation of traffic signals requirements a .
- signify amount of planning and design by skilled .
- design is high compared with coat ..
- warranty for the installation of signal minimum requirements..
-the traffic signal meet the minimum quee length warrent .
- the investigation of signal site and installation of traffic signal requirements the following tasks:
*Candidate site identification , warranty study ,
Signak design .
- signal installation
* Commissioning ,the road authority phase project ..
- checklist given in to this .
* Can be used for
- checking aignN design ..
- approving of traffic signals the approving of traffic signal the checklist bshould be signed by responsible vrefister professional .. engineering or technilist of the road authority
*
* Candidate location for the installation of traffic signal can identified by means of variety of methods .many locations are identified ..
- makers traffic engineering and techt in the employment of a road authorizay can also. Contribt in this regard
..- the quee length warrent used for justify identification observat over a short period of time during peak .hours at a junction or a pedestrian crossing would .
- indicate the presence of long queues of vehicle ..
- a site should initially be inspected ..
Establish whether it is like ..
- candidate site for signalisatiin has been identified a study should undertake to establish whether the installation of traffic signal would be warranted accordt to ..the study must start ..

* Risk mat traffic signals : the availability of knowledge an skilled professionals and technicians ..
Minimum staff ..
- differentit is made
- by appoint consulting engineers contractor , sufficient number traffic

signak operation warrant the employ such range .
- trafft ent professional.. support personnel such computer programmer case ,design operator and admnistrivsv specialists training ,ent technologie should be received .
- specialist training ..traffic ..
- responsible for functionalite .
- managemt and control of the traffic signak , department or divisiit ..
- next step in the warrentvstudy us to establish whether no viable and feasible alternative solution.
- other than trafft signaj is avait .
- implementating ..-
- finaj step in the study is to undertake a quee length study .will be met a traffic signaj installation would be warranted if the site passes this final test ..
- when traffic signak is warrant the site can be placed on lriot list untik ...

-traffic signal has been warranted at a junction or crossing the design of the signal can proceed ,traffic studies should be undertake the site must survey contract documents specifications ,
Requirements contract documents undertake the work ..
-a proper land survey should be made of site showing LANs survey should be made of site ..property boundaries and fences .
- carriage ways kerbs shoulder ,island median existing road marking ,paves side walks driveways drainage structure ,plant and vegetation location ,size and spread size larger tree, ent service electricity water sanitation roadside, furniture , telephone biitg training walls guar raik and logg poles ..
- any other structure such as bridges retaining ,walls ,fikks and cuts ..
- important that attention should possible geometric improvement of a junction during the design phase given auxiliary particut rigth .turn lanes ,but also possiy turned straight through is required..
- the site regularly visited inspected design stage ensure v .
- inadequate space for traffic signak placemt
.distance to adjact traffic signal site ..
- location of any nearby emergency services that requires priority most appropriate location for the contrikkerv.
- condition of road pavemt for installation of look detector .source of power...- parking space for signaj maintence vehicle...-
- proposed design discussed ..
* Design plan would :
-Junction or crossing design showing the geometric design road sign and marking...- traffic signal layout plan showing the locatt of traffic signal faces signal post overhead ,gantries of antivers loop detector and the controller,
- duct diagram ,indicating the position ducts ..draw boxes .

- existing engineering service plan,indicating which service have to relocated .
- traffic signal timing and phasing diagrams ..
- sucessdt signal installation depends on effective supervisor and control during installation ,high degree of supervist is required to ensure that the signal installed according to specific:
Installation done by the authority ..

* Before commenct with installatt the contractor ,
The typical installation sequence for traffic signal installation .
- civil engineering work .,underground ,footing ,cable earthing and wiring ,detector look ,above ,
- signak posf and ovegead installatt.
- traffic signak head.
- electrical wiring and conduit .
- cabinet and control equt .
- electrician connection .
- testing installed signal ..
* Particut attention must also ..traffic accomodat of trat ,trafft signal faces should control maintet ,traffic signal face , liability claim resulting from accidents ....
- of the progress installatt of the signaj .
- any delay must ...any change initisj design property ..
- traffic sign : commissioner: before signsn finally commissioner it imperative that the installation property checked and inspected and traffic signaj operation .
- during this check all signaj plan should be test .
Once been ascertained..
- not as replacement for the contract specifications.
- and suppliers ,the checklist should ..

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-*12.. overview :the foundation course subject..

- traffic system management , municipality , public sector manage ,road traffic management ,
Selective traffic law enforcement..
*Selective traffic enforcement,@ ,,
Emphasising RSA : RSA aspect 1996 constitution and the principles of constitution liability and justification vdefensr ,criminsj concept lability conceit law and the variouse division be emphases ,intention the difference between mistake of law fact sinne triaj aspect .Pre trial and methods of securing attendance of accused in court an topics ..
* Student will exposed law relevant the subject ..
Specific offence in terms of road .
- traffic legislation definition and legaj meaning of the following term driver

motor vehicle driving a motor ,vehicle without a license speeding implicatt type offences in the event an accident reckless ..
- or negligent driving under the influence of intoxication motor ,, while concentration blood is more than concentrate ..
Exposed to other offence in terms of national road traffic act 1996 act of 1996 act no 93 and additional .
- offences in term of the criminal procedure act 1977 act n 52 defesr or obstructing the course ,justice contempt court oerjurt subordination and perjury conflicting statement under oath , corruption ..
.law evidence important concept importa .law of evidence type of evidence issue relevant to ...
*- traffic criminology . Department of safety and security management..
- the object is to focus on the inappropriate handling of road traffic offence as well .
- undertake own gain ..
+ Misconduct the emphasis is also in the development .and implementating of measure to limits ..
- traffic system management : an introduction traffic to the traffic fraternity role players and their internal relationship in the Engineering enforcement system ,such registration licensing policing and accident detailed attention.at
- tactical and operational levej at strategic level . identification ..road traffic disaster management structure and implementating totaj
-
...

- overview : security pratice school lowv
Introduction to security at supervisory levej introduction to basis security concepts implementating of administrative procedure physical procedure in workplace
introduction to access control ,inspection Patrik and observations technologie .
Control of access to public premise and vehicle act 53 9f 1985..
- criminal investigation : general irientay to criminsj investigat include the right,,
-overview : law including security with criminsj justice system discussion on selected crimes such injuria , the relate , housebreaking ,fraude damage injuries property ..
Private industry regulation act 56 act 2991: arm and ammunition act 75 of 1969 and fire act 75 of 1969 and firearms control act 69 of 2009 explosive act 26 of evry drivers..
* Criminsj investigation of the crime scene inckudung scene search for evidence rwiten statement format requirements , if good giving evidence

the paterne if criminsj court proceesing and giving evidence in court role intelligence .
& Basic fire prevention and safety .basic fire prevet and safety controle and extinguisher automatic sprinkler system ..
-*security technology : introduxtiob technological technical such alarm , surveillance ,CCTV camera detector contrik the objective this module is this equipy supervision with knowledge and skills technique and interpretation infirmat gathered or detected variouse security objective to apply basic principles technoy and security system such as utilisation of the security ,,

..
Module overview the criminsj justice process learner . background information in criminsj to equi.law necessary skill person when using arresting person for seizing article ,module learner ,, court present such evident in a criminsj court in such ..
- investigation terminology the role of investigate with the corporate envit established and investigate report value witnesses in a investigat basic interviy skikj cooroort ,philosiy ...
. Basic interview skills corporate fraud and cases housebreaking and preventt of corruption..
- industrial security distinguished variouse philosophies and concepts and requirements of a propriety security application functy if security as business discipline position function developing structural framework for emergency planning and managing of the guardians security awareness creation and maintenance ..
- security pratice : security risk asset crime risk assessment crime related rush measures and analyse crime risk in organisations risk contrik physical and organisat ekemint of crime relate risk reductt of crime risk insurance ..
- *security contingency planning .
The meaning and multidisciplinary natur of contingency planing typicaj crime related emergency threatening an organisation fraud ..
-* advanced corporate investigat : introduction to corporate investigation management of internal corporate investigat corporate intelliy ,prevention theory principal security analyse system penatratiob

_____
* Training of security service provider ..psira ..
Purpose regulation interpretation..
- private security industry regulatory accreditation.
- general function authority
- accreditation if skikj development ...- registration assessor moderator .
- learning ..

Training requirements.
Categories , application ,guard close protection ,security electronics ,control operator ,lockmist ,private investigator v,dig handler ,national ker ,armed

Ribery ,advisor , managed ,training instructor ,moderatut
...

..- qualicafition in relation labour.criteria , assessor.
* Analyse the pension funds act as it applies to the administration of retirement funds .
-describe function of mediating bodies in labour relation .
- apply Cass law and judicial precedents to labour relations issue.
- apply the arbitration act in dispute resolution .
- apply the provisions of extension of security of tenure act ,62 of 1996 Esta .
- conduct a labour conciliation process .
- conduct Pre concilloation by telephone in term in terms of the Ccma rules ..
- conduct referrals in labour conciliation ,considerar a condinat application .
- demonstrate apply an understanding of the basic conditions of employment act ,demonstrate apply Ccma ,relation labour act respect to collective agreements levejk ,established basic princit of evidence in mediation .
- identerpret and apply employ equity legist to industry charter .
- interpret and apply provision of the labour relations act relating to organisation rights.
- interpretation unfair labour practice legislat in dispute resolution written and conduct an arbitration process .
- write arbitrat award .
- analyse and interpret unfair dismissal in dispute resolution .
- conduct a disciplinary heart .
- consider advisors award in labour dispute..
- consider rescisst and variations applications ..
- describ and apply an underst of the interpretation act 33 of 1956 interpretation of statutes act ..
+ Manage and conduct an in limine hearing ..
- access process adapt Nd use data from wide range text ..
- apply principle of dispute managemy in labour relat .
- conduct negotiatt in labour mediatt .
- demonstrate an understanding of Rs legal framework .
- use communication technique efficuet effects.
- conduct interpersonal management .
- apply efficient time manat to sorh of a department .
- apply the compensation for occupational injury and disease AC in mediatt.
- apply the occupation health safety act and the mine hey Nd safety act in mediatb..
- apply the promotion of access to infot act mediatt.
- apply the protected disclosure act medhsgion .
- apply unemplt insurance legislat in mediation .

- conceit dispute in relat to training legislay .
- consideray dispute .demonstrate understand transformative .describ promotion of administrative justice actv and principle of administration .
- drafted employ .
- operate the case management process .
- apply labour prevention approach..
- apply solving technit to make decission in multidl, interpretation unfair dismissal term of labour ..

* National diploma relation labour resolution , national dispute legislatt and humanity
...

*Overview: skill development . Legislation ,sector training authority , seta manufacture relate merseta , Teta ..
Education edpseta ,
Regulation work education technologie ..
- introduction :merseta code objective
Use measure checking ,firming cutting ,marking and satenibf tools and tools aids ..
- measuring and marking tools ,1,0 mm accumulative ,dimy tolerance and 2° angular tolerance
- checking tools : forming ,cutting and marking tools ,correct application akk safety aspect adhered to ..maintain measuring checking cutting is hand tools applicable to the trade all safety aspect adhered to.
- all tools and equipment are clean after use ...* Workshop tools : use fixed and portable drilling machines .
- correct speeds and feeds to be used .
- holes to be within, 1,0 mm of centre .
- correct cutting compound to be used ..
- use fixed and portable grinding machine including replacing setting trying and ringing wheels all prescribed safety standard applied ..
* Wheel must material recall the physical properties and characteristics metak ,
- Minit of 15 ayesti with at least 80% pass ,identify the follt conducting with respect to conductivity current carrying capacity and correct accordt to sabs 0142.
- identify and use the folt insulating materials with respect to resistivity .
- temperatture and hydroscopic.quality pvs glass fivt resins tales varnishes epoxy compound and PVC compound correct according to the relevant sabs code and. Manufacture specifications..

_____
* Module code objet criteria drawing sketches .
* Recall symbols and abbreviations used in electrical circuits for schemat

and wiring diaht connection schedules ,cable layout and single line drawing a test of minimum ,
25 question to be set with an 80% pass mark in accory to recognised code of practice .
- recall symbol and abbrevy as used in Engineering drawings a test of minimum 25 question to set with an 89% pas marks ..
- recall symbols and abret pertaining to electronics circuit diagram 100% correct accordt industry ..
- interpret electrical drawing
- correct accordt to an acceptable code of practice ..
- interpret electronic circuit diagram
- explanation of drawing to be 100% functionalite correct ,
- complile material list from electrical ei and electronics drawu . correct according to given drawing.
- marking off ..
- mark off project applicable to the trade ..
- all angle to withing 39+- minute ..
- all dimy to withing +- 0,25 mm .
- mark off projects for manufat using all standard marking .
- off technique and tools .
- punch hole centre 100% correct ,Ll diment to be with 0,25 mm
- fabricate a project applicable to the trade ,
- all angle to the within 30+& minute ..
- all diment to withing +& 0,25 mm ..

.* Charoen chisels cutting angle is correct and mushroom in the chisel head ,sharpen drills ,angles according to tables and application .
- dress screwdriver.
- all safety aspects adhered to .
- screwdrt to functionality
- sharpen ...- correct included angles according to application arc wet ..
- identify and set AC ,and or DC weldit machines equimy including starting up and shutting down procedure .
- correct according to manucture .
All safety aspect ..
- differential between arc weldt consumat correct to manufacture soecifit..
* Prepare material for arc welt : correct accordt to compound welding procedure and pratises with regard to weld joint preparai voltage , amperagy ,and welding consumer..
* Tack and arc weld work piece incidental using manual metal arc weldt technique ..correct accordt to company quality control procedure ..
- all safety aspect adhered .
- identify and up oxygen .fuel gas weli ligth up gas pressure and shut down procedure ..
- all safety aspect adhered to selection .
- differentiable gaz welding consumatv.correct according to manut

specification .
- prepare material for gas welding .
- correct according to compagt gas weldt procedure with regard to join preparau include gas welding consumat.
Gas wels work ..
- correct according to compagny quantity contrik procedure .
- gas cutting and heating ..
- identify and assemble gas cutting and geat equipment .
- select nozzles and gas pressure for cutting and heat different matert of various thucknt ,100% correct ..
* Basic liftu technique : recall overhead crane signals , 100% correct accordait to recognise code of practice ..
- used the follot equipment .
- chain block ,2 ton max ,
- shackles : 2 tin max .
- chain slings : 2,5 tin max ..
- wire slings : 20 mm diameter ..
- no links in wire rope sling and chain slings ..no damages to equipment.
_____.
* Electrical measuring ..
Selected and connected the follt pannel meters and interpret the .reasit voltmeter ,ammeter, energy meter (kWh) .
- Meyer selected and connected ..
* Gives correct reading on meter : electrical testing instruments portable : ..
- identify and use the fit instrumy for safety and fault as used for electrical syst up to 759 volts : voltage tester ,multimeter ,insulation tester , oscilloscope,earth leakay polarity tester ,phase rotation tester and signak generator ,correct test instrument selected for the application .evaluation of test readings.
-* module code objective criteria soft solder ,prepare and solder the fou: hard copper : soft copper joint to be selected and mechanically sound ,soldering component into a printer circuit board ..dry joins ..
- no damagt to component tracks or printed circuit boards ..no solder bridges .- solder geigtg not exceed 1 mm.
- fault fit : fault find on the follt : controle panels ,distribut ,boards ,contractors ,relays ,insulator ,fuse holders and motor control gears ,
* All safety ..correct test instrument is used ,specify as per draw is adhered to ,assemblies are correct .
- all fait are corrected ..
- fault find on the follt equipment ..
- control panels ...boards contractor and relays insulators ..
: fuse and holders .
AC heavy current motor control equipment and pratical application of fault findt technique ,open circuit ,short circuit ,under voltage Reay faults ,retaining fault, single phase faults ,mechaint faults ,

- specific fault applicable to panels and the diagnoy of the specif fault symptom of each panel result of its purpose and composition .
- all safety aspects must be adhered ,
- current testing instry must be used.
- sorcificat as drawing must be adhered to all mount must be correct ..
- all fault must be peemt safety and neatly ..
- module code conductors : current carrying capacitor accordance length and cross section area ,correct according to sabs 0142 .
Joint conductor by the following methods : crimping ,soldering ,correct size ferrukt to be used,correct crimpit tools to be used ,join correct according ,,.
- module cables : make off and join multi and single core standard PVC ,armoied cable up to 16 mm.sqr ,4 core ,1209 volt insulau ..
- glands ,ferrules and lugs used to correct according to manufat specificatt join to be electrically and met sound and according to manufactt specifications..

-identify rating of cables by current voltage and temperature .correct according .
- recakk method of storing cables correct according to , sabs ..
- terminate pvx cable (up to 1299 volts insulation) for entry into cable end box using mechanic and compression.
- correct according to sabs
Identify XLPS cables , 100% correct ,electrical equit

Maintenance repair and test the following equipment : contrik panels ,distribut boards ,contractor ,relays ,switch gears ,circuit breaker ,time ,isolator fuse holders contrik gears ,electrical machine protective device and ligthu systems ,

* Module code objectt criteria wiring , design : design and the following with reference to the applicable drawing ,panels ,start ,motors ,motors gears ,electrical distrt ,system ,protective ,system lighting system incly dischary and fkuoret lamps ,.* All safety stayv..
- all circuit function according to specificatt.
-mount wire and connect the folt switch boards ,distribut boards ,motors controls isolator, electrical eqt ,
- safety standard to be adhered ,all circuit function according to specification.
- wiring correct according to sabs :
Introduction to wire ways includes the follt ,
- racks trunking flexible conduit corrected according..

___
*AC Machines : design and wire control and circuit to which the follot single phase machine can be connected take into considerat protect and safety .
- capacitor start motor ,forward and reverse ,capacitor start ,capacitor run motor ,forward and reverse ..

- phase rotatt 100% correct ..design and wire the follot main circuit ti which phase sqyirek cafe induction motor cab be connet take consideration protection and ..
Safety equipment that must be used ..
- direct on line forwat and reverse automatic start ,delta ,auto transformer ,constant torque motor ,2 speed ..
- correct according ..
* Module object criteria design and wiring follow contrik and main circuit to which a tree the slip ring induction motor cab be connected ..
* Hand and automatic control resistance starter or current limited started starter ,take into considert protectt and safety equit that must be ..
- phase rotation 199% correct .
- correct according to sabs ,connect three phase and three single phase transft in varut combinat to obtain various voltage ,phase rotatt 100% ..
Before commissioning test follot AC machit electrically and met..
- capaciti start motor ,capacitor start motor , capacitor @, 3 phase sqyirek cafe induction motor ,3 phase slipn ring motor..

* Transformers ,auto transformer ,
- correct according to sabs 0142 test procedures , all connections electrically and mechanically sound ,
- capacitor start motor ,caoacitirv run ,3 phase ..

- transformers ,all fault must repaired permently and to manufactt..
- obset on fault symptom on AC pandk and diagnostt composiy.

- DC machines : connect test and fault find the follot DC machines ..series machine.
Shunt motor ,compound ,rotation 100%,correct ,coorext accord sabs ..

_____
* Module code object criteria electronic:
Electronic compot : resistors ,wire wound up to 10 watts ,carbon and metal oxides @ watt caoacitirv,electrolytics and ceramic diodes ,
-:

- thyristor ,100% correct to manufactt specificat , constructy solder and fault find the following circuit bib,stable multi vibrator , elementary ,SCR speed contrik ,all circuit to operate functionally correct ..
- Tracey oscilloscope up to 29 MHz to ,.wave form DC ,AC,average peak values , frequet ,RMS values 100% ,,
* Programs and use P.L.C systet according to compagt requirements and manufacture specifications ...
.** Overview: theotett training a four subject pass is required to attemp trade test ,mathematy and the relevant trade theory subject compuly future chouse empolyer apprentice college in order to obtain four subject requirement ,plus two relevant subject subject certificate should be

allretice have qualitthan ptescri in the schedule ensured ..
On job exoey and indepet work ..: on the job exoey and independent work coverage 89 % pratical module to ensure as wide possible field ..

_____
Overview ,:
Manufacture process ,manufacture fundamental machine ,, processing
Claim invention components

...

Manufacture process technologie ..
Component trade process ..

. technologies electric metal allow,,step trade limiting winding step process
Assembly dissembli dismantle ..

_____
- ligthining. protection.
- electric fences .
- stoves .
- electrical diagnoi.
- new installation .
24 hours electrical emergency.
- residential electricity .
- ligthny strike repairs .
- faulty plugs .
- electrical mainteny.
-electricL repairs.
- rewiring .
- swimming pool db board ..
- cable fault of testing , repairs .
- faulty plugs ..
- electrical mainteny ..
- sub db board .
- rewiring

* Overview : department of labour occupation health and safety act 1993 certificate of compliance ..
* Certifiy no ..
- certificate types tic , appropriate bloc ..
- certificate of compliance in accordance with regulation 7(1) of the electrical installation regulat ,2009 ..
- identification of relevant electrical ,address ,subtienshio ,pole number ,district town ,name buildut ,erg ,go's no ,
Declarat :

- I have impact. Per the reqt of appropriate :
- a ,electrical installation regulation ,8(2) (a) new electrical instally .
(B) Electrical installation regulation ,9(2) existt electrical ..
- electrical installation regulation ,8 ,2 new part ti an existing ..
* Test report electrical installation to sans 10142-1....
Note coverage report only part installation ..
- owing refrigeration plant ligth .
* Number of circuit or points : existing new altered temporary installation ..
- sub district board ,sub distribuy ..
- sub distribuy board ..
- circuit main distribuy .
- board distribut board .
- ligthi point .
- socket outlet circuit .
- socket outlet circuit .
- socket outlet .
- three phase socket - outlets ..
- socket outlet critical applications .
- motor circuit ,control circuit ,air Cindy...-
* Relevant electrical instalt :
Installation ,yes date issued ,number ,Lterafion /alteration new type of installatt industrial ,section .estimated years of origint installatt..
* Type of electricity supply system .
Tn- s., RN-C-s,,TN-C,,TT,,IT,,

- supply earth terminal provided ,,yes / no
- characteristics of supply voltage ,
230V ,,400V,,525V ,,other number phase ,one ,two ,three ,phase rotatt , clockwise,frequet anticlockwise ,50hz other ..
Home determined calculated measure. .
From supplies.
- switch disconnect or on load isolator ,fuse switch : circuit break
Earth leakage circuit breaker ,earth leakage switch disconnect or number of poles , current rating ,a short circuit ,switch ,withstand rating ,rated earth leakay tripping current ..
30 mA,other ,.- surge protection yes /no
- is alternat power installed yes/ no
- is any part the installation special yes) no ..
- tr if yes completed test report ,motor controller assembly
circuit .gating ,bell other
Heating circuit ,elevator circuit ,fixed aopliat circuit ,
cooking ,geyser ,borehole ,pool pump other ,
- earth leakage ,main switch only socket outlets ,overhead bus bars .
- althernatt power supply connecty ..
* Key : indoectu and test ,existing yes not ,tempori installatt,
- accessit compone are correctly selected ..

- all protective device are correct rating and capable of ..
- conductor are the correct rating and carrying capacity..
- the protective device and connected load ..
- component ..
- discontion circuit are separy electricallyv..
- connection of conductor and earthling Nd bonding is mechanically sound ..
..- component device are correct located all switchgear switch the phase conductt..
- different circuit are separated electricallyv..
- connection of conductors earthing and bonding is mechany ..
- circuit fuse ,switch ,terminals earth leakay ,circuit breakers ,
- in respect of the electrical fire barriers have been erected .
- safety and emery ligthning and sign are functy correctly ..the installation including all accessible component complies .sans 10142-#..
- posity of the readily accesst earthiy terminal for earth connection other .. Service of such service ..
- alternay supply connection,change over switch and indicay..readit ,result ,
- test unity instrumy : new alternatiib ,continuity of all bonding ,, resistance of earth continuity conduct ,continuity of ring circuit ,eaetg loop impeday ..earth ,insulation resistance ,voltage main db ,,voltage ,operation of earth ,operation polarity of point of consumly correction ,correct,,,Ll switch ..
.. certificate resoinsabily bear knolege ..
- material specification / procuremt material .
- construction electrical in salary ..
Inspection test
Type master installatt electrician single phase registration ..
- safety general principles installation. ..
.- departt of labour occupatt health and safety act ,1993 certifiy of compliance ,GEIA,,, supplentt certifiy accordance regulatt ,7 (1) ..as issue ,identification relever electrical installay ,address unique. Where applicable ...address ,sub town ,pole number ,bname building ,erg ,lot ,go's co ordinatuib declara

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-* Overview: Education technologie labour ,,
government notices department of labour :
-occupation health and safety act 1993 electrical machinery regulation,2011 the minister of labor has under section 43 of the occupation health and

safety act 1993 act no 85 of 1993 ,after consultation with the advisory council for occupational health and saft made the regulation in the schedule..
- definition :
1. These regulations " the act means the occupational 1993 act no 85 of 1993 and any word Ord expression to which a meaning has..
- been assigned in the act shall have such meanint and unless the context ..
- Sanaa established by section , assessessment valobray and good laboratory practt act 2006 act no ,19 of 200..
* Circuit ,conductor means arrange carry conduction ..
* Confined space space and electrical conductor ..enclosed restricted or limited space in which .. hazardous substances accumulation ...
- dead means at about general mass of earth ..will ensure an electrified safe discharge ..electric fensr ..energetized : Barker electric consists ..means electrical machinery arrange so as to deliver a periodic no lethak amount of electrical energy to an electric system ....
Insulated : live ,alive ..
- a flexible cord at the supply end which is intended for use by hand , which to carried by hand la place work..
- flexible cable at the supply end and which intended for use by hand ...-registered .means a personal registered in terms of regulation 14 ..
- these regulations shakk apply to the designer
manufactt .installer ,sLlerd ,users ,employers and suppliers who design manufacture ,install ,sell generate use electrical machinery ...
- regulation shall apply to user who generate transmit or district electricity wether ovegead or undergru to the point supply .personal protection ..
-an employer or user shall provide free of charge and maintain in good ...for use by persons engaged in working or in close proximity .for use personal in or close proxt to live electrical . machinery or dead electrical machinery which may .work on disconnected electrical machinery ..
- without derogating from.
- employer or user of machinery by the act an emoloi or user shall whenever work is to carried out on any electrical machinery which has been disconnet from ..
-:source electrical but which is liable to acquit or retain ..
- charge as far as is practicable cause precauy to be taken by earthing or other means to eaethiy or other meat to dischary the electrical energy to earth from such dkectricH ,machinery or any adjacent electrical if there is danger .before it is handly and to prevent any electrical machinery from being charge or made live while person are working therib ..
- an employer or user shall cause notice to be display within ,designated entrances to premise as the case may be where generating plan and transforming switching or linking apoarutus are situated ..
- prohibit unauthorised person from entering such premise .
- prohibit unauty person from handlit or machinery .
- contain direction of procedure in case of fire and contain directly on how

resuscite person suffering from the effects ..of electric shock ..
- provided that this regulation shall not apply to miniature substation and distribut boxes ,on condition that their access doors can locked or bolted switchgear and transformer premise an employer or user shakk cause enclosed premise housing ..
- to be of an ample size si as to provide clear working. Space for operating ..and maintenat staff ..
- to be suffiy ventilated to maintain the equipment bat a safe wory..
- temperature : to be as far is practice constructed si as to be proof against rodents leakage ,seepage and flooding ,
- to be provide with ligthning that will enable all equipment thoroughfares and working area to be clearly distinguy and all instrument,label and notices read.
- to have doors or gates which can readily opened from the inside..
- to have doors or gates which can be readily opened from the inside opening outwards ..
- to provide with fits extinguisher applishe ..systemes which are..
- working order provide that in case of unattaded .
- fire extinguisher appliat be made avait at lremisse ...-
- conductor or exposed live parts of the electrical machinery.
- no person other a person authorised therti by the employer shakk enter required or transfer unless akk live conductor are .insulated against inadvertent contact or are screened off .provide that ...- an employer or user shall provider device which shall ...no employer or user shall place switch circuit breakers or fuses in neutraj conductor of polyphone alternating ..
- operating maintenat staff at back front ..
- switchboard which have no uninsulated conductors accessible from...
- switchboard ,the switchgears of which is of totally enclosed..
Contructt..
- switchbkt ,the backs of which are accessible only through an openit ..in the wall or partition against , such closed ..
- switchboard which can be safely and effey maintained from the front .and which part accessible from the front ...
- the employer or user ensure that all switch board Ares selected manufacture installed mainyened in accordance eny practice ..
Machinery electric in hazardous location .
- evrt employer or user shall identify all hazardous location and classify them in accordance with the relevant health and safety stat incorporated into these regultb.
No person may use electric machinery in location where there is danger of fire or explosion owinf to presence occurrence or developm of explosive are manufscy ..
- handled or stored ,unless such electrical machinery with regard it's ..
- construction relation to classifi of the hazardous locatt in which it s ..
To used ..
- purpose in these regulations 44 of act ,evry employer or sub regulation

shajj ..possession of certificate in a form acceptay to the chief that electrical machinery breffees authority ..electrical machinery reffered..
..- when diverse items of electrical machinery such as motor cable. Apparatus are used toget to form a system the employer or user shakk ensure that the selection arranged installatt protection maintenance and working of the system results in no less degree of safety that when the ..
- the employer or user shall use electrical machit to which this regut applies only under such cindt and in such surrondi ..
- no employer or user shall effect repairs or adjustments to otherwise .
- with on electrical machinery under conditt envidat by sub regulation .unless such machinery has been rendered dead effectt measure have been taken to ensure that such machine remains dead ...- wherever there is ossibkd ..metallic. Machine parts pneumat conveyor ducts and pipelit conveying flammat.adticks the like or take such other measure as may...-
- prevent.formatiib electric sparks ..
- the employer shall cause all machinery ..any other inyerbt
...

- test is verified in term of the approved design ..
- the person carrying out the examination referred to regulation .shall enter sign date the result each examinat in record book ,shall be kept by the employer or user for purpose portable tools ....
- it is connected device the constructy of which meet the requirements relevant health safety , regulation under section 44 if act ..
- it is connected to a source energy through the interposition between each tool and the source of an individual double sound .
- isolating the construction of which..
- it is conney to a source of high frequency electrical energy derived from a generator which is used solely for supplying energiebportabls electric tool and which arrangements is approved by the ..
- it is clearly marked that it is constructed with double or reinforced insulation..
- no person shall sell a portable electric tool construct with double or reinforced insulation referred to in sub regulation ..
In sis constructed in accordance with the relevant health safety standard incorporated into these regulations underst section 44 of the act..
The employ erb maintain portable lamp ..metahl not permit to use of where the operating voltage exceed 59 v unless fitted with substantial handle made no hygroscopic ..a live metaj part or parts which ,, the lamp is protected by means guard firmly to the insulated ..
- the cable lead user shakk use permit of a in wet damp condition .large masses of metak unless provision ..lamp is connected to source of electrical energy incopot earth leakage protection devices the construction which

meets , regulation under section ,44 of the act ..
- the operating voltage of lamp does not exceed 50 v where electrical energy is from transformer transform ....

-; regulation under section 44 of the act provide that fence electric energizeer ..accordance machinery regulation intj force shall deemed to comply with this regulation .
- the seller importer and manufacture of an electric with this ..issuing fence certificate..
- power line cross proclaimed road or conductive communication line suplief employer the clearance to comply with the requirements of regulation 19 ,support span to design in such manner will be able ..
Crossing over service ,including conductive communication the line user of other service ,supplier employer user cause evry overhead service connection that crosses over bare conductive communication netwt to have minimum clearance between service connection and the conductive communication crossing of 9,5:and the ovehed service connection shall not cross below b. ..conductive of power line which cannot be completed insulated premise ..
- crossing 1,1 kV ram alternative duplication BN..
- offence and liable convictt ti a find or ti impisonmet of one day each day on which the offence continue provide the period of such addiy impristshakk 90 days repeak of regulation .
* The electrical machinery regulation ,1988 published under notice ..
- and ..
- department of labour occupation health and safety act 1993 electric fence system certificate of compliance..
- electric fence system certifit of complit in accordance with regulation 12(4) and 13(1) of the electrical machinery regulation , 2911 certificate no certificate ..
- initiaj supplementary ,certificate ,
- supplemt no ,,, to initial certificate nin..
Issue on .
- identificatt of the the relevant installation ..
- physican address :
Name premises...go's ..subord ..towshio ..ENR ....I'd ..to clear identical uncounted photographs 40 mm by 39 mm face ..
- sign of magistrat justice of the peace commistv..
- specime signature ..
Certificate normaj ..
Particularly ,surnames ,first names ,I'd no.
- trade name ...state type of registration .
- scope of accredit .
- in support

...

-overview : technical evaluation physical security and safety guard contract ,,enterprise am commission electric. ,case Eskom ,Eaton Scheineder etc Microsoft ...
-Operationel requirements :
Item : detailed question | score criterion| source | score .
- compagny experiemental : 15/100(5%)
Compagny rendered | is the company well established | 3 years more | original.

-man power : hr : adequate resources and capacity manpoy number to render the required service as outline ..
- does supplies have comphrensive hr policy that address source screen ..act
- hr plan that covers sourcing retentt strategy criminsj record partially retention ..
- the supplier approprt number fire arm pistolet CFR ..
- the supplier must emergency preparedness and respy operator must knoledy ..
/ Emerget prepardens procedure contact number available b.are operator duty is minim ,contrik ,| score totaj for ..| controller operator to demonstrate knot outling ..

Fire arm ,etc...

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*13...Overview : engineering electrical motoring transport traffic .labour

*Goverment notice departmy of labour : withdrawal of goverment notices and incorporate healt and safety standar in term section 44 ,2 occupational health safety act .1993.
- driven machinery regulatt 18 (1) ..
Training provide lifting machine operator accompt valid issue ..
- scope :..
- definition.
- duties authorised bodies.
- duties of accredited training provides ..
- field of activity .
; training system .
- record and retenty .
- training course duration .
-operator with previous certificate.
.condition certificate . requirements b.lift certificate machine explanation ,general explanatory note , ..
- code practice vetwa Sawa assessessment.collecting evidence learn work

measure judgement achievement or non achievement ,saqa ...1 it si Pre - requisite : the operator of specialists equipment will certificated in basic categori applicable .
- example a pratical assessessment mark sheet accredited provide ..
- candidate ...date...
I'd number :.... Machine type :....
- machine make : machine code :
- comoay : ...capacity : ...
- Pre start delete item not specific test machine or condition personal protective .safety shoes ,boats load chart max mass ,forks attachi positt of load barckresf tyre .
+ Machine condition shell nuts .
- battery termit ovehead guard .
- electrolyte levej engine ,transmist leaks .
- engine oil levej engine transmisst leaks .engine oil , hydraulic oil leaks ,brakes fluid kevdb oetrul ,diesel leaks ,radiator ,water leaks ,water pump drivers con ,fan blades hydraulic cylinders ,drives belts hosess condition drivers condition fuel level ,
- Pre - operational test enter adjustvseat gauges ,control levers ,pedals ignition ,raise load door brake ,tikt front back hand park ..
- ligth ,indicator unchecked omissions to check any one these.earnervoperator ..
- theory test question .
* Penalties .
- total item unchecked from Pre start and operationel assessessment : × 2'.maximum 20 penalties ..
- totaj Pre start and pre- opera to ional penalties pratical operating asssessment ,
- penalties :
- forks bind on entry withdrawal = × 5 =
- fork not central under load = × 5 =
- load not at heel of forks = xS
Stack ,) de - stack with mast tiles =
- fails to apply park / handbrake = x5
- fails to place in neutral ° x5
- faiks to lsitiib mast for travel ° X 5 .
- fails to position forks travel ° .
- places body outside cabin = x5 ..
- bump side of course = 10
- fails look in direction of travel =
- select wrong contrik direction .shunt unstacj ,,
Shunt negotiation chicne .
- fails to release park handbrake .
Faikti hold steering wheel during travel .
- accelerate erratically = X :1
- brakes erracficakky .

- hand on contrik ..
- faiks place place in neutraj ,
- faiks to set off gas °
- faiks shut ..
Faik to switch .remove key..

Totaj operating and close down penalties .
- time penalties.:
The assessor is to comply course ..
Competency not yet comptents ..
I the undersign acknowledge that process and result were explained to mer and I accept .the outcoy the assessment..
..machinery regulation certifie baccredt statement of results.
Number of accredited provide ,number learner assy ,number of monitoring audit ,number certificate new retained code ,,
- training system etaa record rentiin ,all record maintain minimum 3 years inspect labour , accreditation provide ensure learner granted theoretical and practical v to enable the learner to attaing competency .criteria training course,learner with priority the hours not exceed operator training subject ..
- operator valid certificate not operate machine equipmtb,operator constsb operator with previously certifie under the driven machinery regulation whose certificate have or due shakk be revcertufucatevtrainingb,4 theory minim training 1 hours assessment 1:1 rate assessor supervisor .
- the ration of learners to facilitator shajj not exceed 12:1 for theory training ..
- the ration of learner to demonstration pratical per machine ,supervisor ..
Upgrade on code learner I operator shall be regards re- certificate provide.
Event where the operators card expire for than 99 days learner undergo,
- operators of immovable machine trained assessed facilitator assessor and work
- should operator meet standard ..
- entrance qualicafition whatever status must be physically
.certificate include ,name logo address number registratyub initial name operator I'd ,code machine reg number ,assessor ...

...

- overview: engineering asssessment moderation policy .critical
Base workplace experiemental theoretical pratical research

.national natrade and national vocational and framework qualification ...
Technical vocational instruction internal continuous assessment icass

guidelines 191 ..
* Introduction: model didactic and Education design
-plannings for internal assessment:
-the icass marks component.
-assessment for different modes of delivery.
-setting of assessment task.
-moderation of tasks.
- recording of icass marks.
- evidence of teaching and assessment.
- monitoring of implementations I.
-circulum
- trimest subject .natural science engineering studies.
- semmester subject general business and service studies.
* Pre - asst moderation process and checklist.
* Post - asset moderation process and checklist .
* Monitt report temply.
* Composite Pre and post moderation report icass irregularity bregister .
* Example of a trimester subject assessment plan .
* Example of a trimester assessessment schedule for students .
* Trimester assessment task for Engineering studies..
* Record sheet for trimester course .
* Semester subject asssessment plan .49 .
- example of semmester assessessment schedule .
- example of a rubric for the asst of a pratical task ..
- record sheet for semmester course ..report asssessment task ..
- subjects .
- semester subjects .75-78 lecture days .7general .
- busint and service studies . test or assignment , external moderati incorpoy in and .
-1 internal examination test , assignment ,internal ..
- types of assessessment task : semester subject mat constitute theoretical knowledge pratical skill and ..
Analysis grid ..this analyst must be done all test and must be submitted ..
- subject ,level lecturey .
- task .
Moderator :
- subject aim:
Learning objectives objectt ..
-question ,format type,
- duration minute .
- mark allocation and cogniy levej .
- total mark allocation .
- short response .
- medium response .
1 knowledge, application , analysis and , problem solving .
- total mark allocation..

- each student must completed three assessment task per semmester only the marks .achieved in these three task will to comply the icass semmester marks for the subject ..table below indicate the assesst.
- criteria examiner . moderator .analyse grids yes / no ..
- name of subject , task lecture and moderator is provide .
- subject aim / learning objecy are listed .
- conceptual level indicated per question instructy along with mark allovay.
- spread of conceptual weigthing indicted for the task ..
- cover page , name of subject ,time allocation and mark allocation .
- instruction to student are clearly specified auambiguous..
- layout is reader friendly .
- the question on the papoer / assi task have the correct numbering ..
- appropriate fonts are used throy the .
- format is correct , check page break spacing .
- marks allocation are clearly indict marks per question .
- the paper can commonly in the time allocation .
- drawing clear completed with mark allocatt where relevant .
- drawing clear and complete with mark allocation .
- quality of illustration graph tables tables .etc clear and print ..
- the task covers learning objectt as prescribed in the policy docuy for the particular subject ..
- the weigthing spread content of learnt objective coverage is appropriate ..
-;short response multiple .choice one word definition bulleted .
- medium response short explanation / description .
- extended response long explanation description requirements several or more sentet..

* Pre - asssessment moderation process and timeline process responsibility. :

- allocate specific examiners and morator must be subject expert ,the allocatt and moderator ..must be two different person.
- examiners and moderator must be subject expert .subject and levej emporewer . developm and moderate assessessment .hod ,senior lecture before class ,commence for trimester . semester program .
- add internJ college due date to manage the time line order to meet the subject commmutte asssessment plan deadlines .
- Hod / lecture .before .
- managing of due date / subject committe assessessment plan ..
- subject and levej name of lecture date ..
- designai of moderator name signature ..
- is the lecture information ..
- council educatiroe RSA save ..teaching lecture experience workplace appont and Durie ..
- subject file contain the ..

1 . Content page ..
2. Class registers .
3. Subject syllabus.

4. Subject work schedule / work plan /
-5.lesson plan and teaching resource .
- evidence of additional supporting tasks as required by college academic policy ..
7 .evidence of reviews : diagnosty and statistical analysis including note on improvement of task for future use ..
8 previous quesy pappers / revision exercise / additional exercise / homework activities / worksheet / tutorials..

...

Task allows for creative response from students where relevant..
The content address is relevant and up to date with development in the subject :.- criterion : cogniyy skills criterys ..
- there is an appry distribute in the terms of cognity level bloom taxonomy or any other taxonomy that may have been used .
- there is correct district of marks accross learning objecy .
- sub questions , sub task ranger from simple to complex ..
- does the assessessment file contact the for:
- content page ,
- asssessment schedules.
- the assessment instrumi and tools the test assignment internal exam , examination papers and accompany memotand marking ..
- evidence of Pre - assessmy moderation ,10% task.
- marks sheet for grouo of student hand written ..
- moderation of mark captured system .
- are document ,,are students marked assesment evidence scripts ..
- where task evidence in the student file for example ..
- hod programmer manager
Total number of student enrolled .
Total number of student asses
Drop rate .
- total number of students who's passed all assesment period ..
- pass rate .
Total number of assesu conducted and moderated number of ..

...

- key language students assessessment framework . qualicafition implementation,and national trade requirements.informariin management

system.
-stationer requirements:
-question pappers and marking guidelines
-errors in question papers .
-release of marking guidelines.
- errors marking and submisst of scrips
- marking and submission of scripts.
-marking model.
- internal marking .
-internal marking .
- provincials and national marking.
- script control .
- completion and subt of marks sheet
- completion of mark sheets.
- submisst of mark sheet .
- marking and moderation during internal marking .
- reporting on the conduct of examination .
- daily conduct reports .
- irregularities detected during writing session.
- irregularities detected during marking .
- reporting of leakage and fraud ..
- storage of script and Portofilios of evidence ..
- handling of application re marks , rechecks ..
- re- marks of Engineering studies n and NC learner l l answering ..
- re mark for the conduct and admnistation of TVET college ,examin..
- stationery requirement ...
Report circulum statement ,time table ,.
- daily conduct reports : it is mandatt for daily report on the conduct of a national examination to be submity to the chief director ,,examination stipulated all examination are to reported irrespective of the nature and degree of seriousdt.
- section heads of college need to collect and collate daily reports from their respective examinatt centre complete.Kk ..
- section of attached daily report and submit it to ..

- irregularite detected during e session it mandaty. Irrespecy if the nature and degree of seriousness also technical administrative iirregularity business ,copies books answer ,script document ,marks sheet not aatandancr or percenty , report 3 working days after occurrence of irregularity daily ,where security on integrity of has been breached wrong , ..
-:
Vision mission ,college police ..
- academic subject and activities .
- after school supervision .
- assembly .

- asssessment
- attandance

- books
- break.
- bullying .
- bus transport .
- cskk phones and electronics device.
- classroom,
- collection of puples
- contrik of work .
- counset.
- detention .
- drugs and illicit substances .
- echo school status .
- electronics access .
- evacuation.
- examination .
- extra mural activities .
- HIV / aids .
- homework.
- laboratory use .
- leadership.
-library.
- merit system.
- parent consultation .
- parking .
- parlementaire.
- plagiarism .
- prize giving and awards.
- reports and progression .
- rigth and responsibilities.
- sick bat .
- stationery and equipment .
- tours .
- tutor ,mentor system .
- uniform ..
* Acceptance of police practice and procedure form.
- merit point system academic merits average according to report term band .
Performance 80% attendance per term report ,grade 1 to 12 ..levek.

- * college and stationery management system ,submit infirmatt guidence valuabu product to carry out day to day
 activities files ,pen product such register erase most ..
Valuable.field ..

- introduction .
- introduction to system .
- scope of system .
- proposed system .
- 2 analysis .
-fact finding technique .
- frasibiy study .
- hardware and softy requirements .
- system designing .
- diagram.
- context kevdj diagram .
- data flow diagram.
- data dictionary .
- forb design .
- advantt and limitaty ..... registration transaction related very few college used automated system to carry out stationery system software to carry out .
- stationery product related software to carry out stationery management system provides application stations products fotg college which an automated system instead of making manueh entries into book consumers greatest amount of time ....
- activities variuise purchase order ,staff met stationery products requirements generate order for supplies and generated bikk for account ..
- stock and bulls generate .. minimise process the application b..
Ti application carry the task help record ,system bills transaction quickly ..
- information store database system ..
- propose system : to ekiy the running cost by overcoming the continuity stationery expense manuej storage need extra staff in the information resources .
- analyse of the new system is important to conduct for marking the actuaj product it is important collect the fact and relevant product minising ..the data collect fact technique are examined to determine how system performance b analyse record check record ,,order books of accot bills create friendly system . .
- we visited stationery .. account maintenance material college ..
- feasibility requirements :
- requirements analysis undertaken meet requirements.
- system post development so actual cost the system .before designing new designed system will provide ..
- operations : automation makes love .
- proposed system very .
Legaj feasabikty ....
- system development life cycle is logical process ,system analyst software programmers and user build informay system and computer applications to solve business need to another major phase involved in the MIS

development Blige cycle phase develop bbend of each phase progress toward meeting must ..
- hardware and software requirements.
Hardware.
- requirements ,processor : Intel dual core ,core 2 DUI / 3i/i5/i7 processor speed minimy @ GHz,,ram ; minimum 521 MB ,hard disk minimum 4 GB , keyboard 104 key monitor ,15" color monitor ,printed ,color black and with laser , fit matrix. Required operating system windob7;8/ front front visuaj studio 29008;VB.net back database .access 2007/2919/13 network specifications
- no item :
1 ,12:0ack crayon ,red pen x1,black with board marker, Bostik prestik ,medium ,pencil ,rules eraser ,sharpen ,scissor,page counter ,drawing art book ,display ,page , Manila's,Jean ,colour , platinum math , English life zbkikk ,599 sheet aR4,toilker papoer ..

- A4 72 pages writing exercise books
Erazer,Glu,stick,rules,pencil,counter book ,platisc book ,

Item
- 1× 196 PG hard copy pah ..drawing exercise book ,
----------:::::::::;:;;;;;;
1× 192 PG hardcover book .
1×16 GB memory stick.
- workbook computer part ..plastic folder .
1× 192 PG blue plastic folder ..
Infotmat technologie ..
Program for grade .. levej
- lector reading programme..
..
Cash journal plastic ,kit

-
…

-Overview: assessment dhet notice govermy extension phasing n certificate,n-6;and n diploma qualifications .lecture Portofilio of assesst means the full and final record of all task presentation Portofilio vof evidence for a oartict certificate assessment vmeans nqfv,assut act 2001 act no 58 of 2001 marking center appoint council educational , asssessment system complied ,subject ..

Introduction b: general the natuonsj policy on conduct administration and management of assessment of in gov ..policy..

_____
-*

* Self -assessment in learning electrical t disciplines : technology uni
Abstract: active learn methods series electric engineering belectrinics and electric drive set principle procedure in evaluation knowledge bbase computer bass..
* Introduction : an active learn quickly find area knowledge theory that learner priblt student learn advance...
Scope learn theoretical and practical task .objectt goaj report research is to discuss ..
- electronics engineering: discipline advance..electrical drives and power electronics..beneficev evaluation assest distinction of practical skill and selft computer skills b..
- asssessment or self assessment where difference scheb existing educational system curriy indicate the number of examination and pratical credit the learner's need to pass rule the students reauirt to take the theory exam that quality them credit prerequisite for further exam typical drawbacks and uneffet of such evaluation ..
- in pratice answer the questions posed to student regarding different aspects of their activtie and narrow ..
- form exN when sold evaluation purpose measure the student's ability to respond the question ask in the from ..real engineering activiy..
- asst learn process scheduling event meanwhtbback progress and achievements promote learni and and to effect on wath the students blearb ,his effectt they spend ..outcom their leartv.. advancement depend strontvon hoev..asst is consiy integral learning ..
- asssessment as tool become
* National e learning portak system the system includ the web textbook on electronics power electronics drivers as well well as the hypertext tutorial video understau , weekly update asset sheet the examin sheet problem and their rules , LCMS evaluation recommend rating information student response teacher to student out of school collaboration is arranged .. primarily open .
- discussion through thank ..
- student self ast rating does not exceed mean that end the terb need take a traditional vexan grade if depended of the proposed examinay probltb.
- during learnit : rating watch instrument adjusting and predict learning outcomes one ..
- self assessment web page self assessment is not only importance process to support intrigue lecture introduced such game excitmet as prizes losses plus minus score levejs barriers etc attrayvto present.day student a predicated grade and expected exam forecast hold the learner alive during hold the learnt semesters..
Practical skill laboratories the student execute earlier prepare expert .usually the circuit and assign experimental starting an approach the learner focus on perfort the actual experimental physical data acquisition for laboratory work as rules student focus on manuej made as cookbook they learn from such tutort aid how to use equipment in accordance with basic

theory principle performance measures fill in the table draw provided this meti does not not consider student..style trainee has to solve the same question our goaj in labs organisat is to approach pratice to the theory as close a possible to effectively employ novej the tools face ..
-;solving skills devet close collat which is caracterist by initiative creativity this also emphasi the benefits b.exoerimentatiij other learning activities because vactivityb follot goal ..student..
...

-additional they apply annimaty ,simmuly and virtual expermy in the form of Java apples or flash object generate response or analyse data .process of student competence evaluation completed module both particular weigti scores and the final grade are prepared and display after report is presented the fi reviy options help the learner to understand the qi solutions and future improve his skillwheter his results answer is correct ,wath is feed back the standard oodkr suitable wathis the teach report engineering ..
- additional benefy is obtained from the self assessment procedure based on automatically scoring answer on the scoring on the questi regarding the pratical lab preparation as well each preparation as well each laborau work involved both the compulsioryvand the optionsj item solution of only major. Problem mandatory.where the other ones are optional participate .will participate vwill students points . Future .. engineering rigthvanswe published .. additional benefits is obtained bfrom benefit is obtay from the self..
* Self assessment of exercise : objecty of exercise in computer simulation are to prepare expert simulation b,expert scheme majority btypes student blearb how identifybsignakbinputb, stimulation collection output data and compare them with excepted responses define textbt and manuej system desi of the diagnostic gn learner responsible for appreciation.. determinat wath fault and multifuct they detect and propagate at below collectt ..first multitasking and personalization are the compulsory condition .. preliminary ..verbal calculation approximately measurements and preliminary estt are the important parts of engineering pratical third students .. demonstrate breaerved..

- nature and appropriateness students collaboration bstudents .and group workings potential the evaluation currently applied ..exercise lesson ,exercise involy both compulsory learner may obtain addiy score implementating the options bparts scoring one score for each the classroom discussion and talks are used regularly as substatiaj instrument of learning monitoring and students evaluation to ensure preparedness for a lesson a quest before during or after the simulation students are asked to search answer increase to the question bthat were preliminary published .
- answer increase the trainee person rating thank to the simple scoring rule

analyse of the in class .. mandatory levej resulted in the ..
- reason of low scoring lies phenomena that . requirements..
- the was found an evident depending between ..
- analyse and discussion b: result three categories b of engineering studies among 259;representaybsecond years bachelor group with any preliminary experiments in active learning second..
- involved two master group who both the learning and the professional experience the diagram result ..
- disciply percdntagy ,lecture attany particiy in self assessment finaj grade ..
-;quiz it seem especit importy for master study where classes along with their increase attendants visit the classes for of self ..representtbmosr ..
-: conclusion: a self methodology in learning electrical e discipline has resulted in development usefully skill as the problem solution effective calculation experiemental performance pratical qualifications:
_____&&&&&
_ overview: engineering assessessment,
UNESCO unevoc ..word skill
 TVET : programm and qualify : system planning and institutional support.examination and assest, Financial planning coordination.
TVET directorates: programme and curriculum innovation ,student development and support ,monitoring and evy.
- curriculum development and support ,instituomsk funding private TVET college resulting certificate ,exam management and monitoring , lecture develt..
* Office of the deputy director get tvt :
Purpose of the branch is to plan monitor maintance and evaluate national policy pratice system vocational educay any training TVET college and community eduy and trading college ..
* General TVET resource : cakandrr academic years ,revised closing and futhute nomination council member TVET college , call public.
- continue..
- annual monitoy report project report projected target student ministriaj .
- continuing educy training ..
* Programmes and qyali chief directorate .: programmes and qualicafition developmt and maintains high qualify vocational education and training program support the implentaty of student service and provide leadersy and support for the training and dt of lecture :
* System planing institutional .. management delivery of vocational and occupation program .

- it Lsi ..
- planing and institutional resource : Education relation conditions :
- businesses rules for the implentai of collective 1 of 20919,28 October ,CA 1 of 2013 generic ,contract of e CA appoiy.
- established.
- CA of policy on recditmey Nd section clarify impletof general public service

..collective agreenyb,dhet curculy in commencement of sect and 12 FET amendy act 3 of 2012 ,, amendment...
- resoluy 2 if , hotline enwuy on the implentation ..
- integrated quality management. ..system for Fer based ..
- invitation to register database of unemployment retired lecture currently apply their trade in industry ..
,- psbc resoluy n agreement on salary adjustment condition ..
Registray college lecture datat .
- salary notched with effect lecture , scales..
-;student schedule salary effect full time employment ..
Appointment .
- student devu : dhet bursary NFS rules ,technical education training colleges student support sery annual plan .

- policy framework on administration and mtof student training college. .
- policy for ncv qualify at level ..
-proposed asssessment record sheet .
- proposed format of a learning program..
Examination and assessment chief director : management : activitiev examit sitting and appointment bof penalties settings print and distribution bof question papoers and cuminay marking results band certificate..
-resulting and certification resource .. minimum height ..national policy act 27/1996 national policy refsrd futhute Education training

_____
Equivalence degree

* nqfv monitoring v issue umalusi bin term of this policy and section ,17;and 18 general and furthy educau and training quality assurance act 2001:act no 58 of 2091 ncv nated n ucpd ,an NQF that will be award edvti studentbwgos with policy nationt certificate .. promulgated in gov gazette no 28677 of 29 ..March 2006; national irregularity committee body establisyby department coordinator of irregularity , learner record database integrated informay system provide students and employer proof if the qualicafition obtain part time student us person bsoreaf ,program over a longer period 1 years as indicated in term section ,4.2 policy student fullfilm integration Summative task requirements measure Pam is policy dict ..governy remuneration ,employmt if educator in term ..future educator act 2006 means body a contemplated in section general future and training quality assurance.. irregularite commited means body Education b national certificate saqa include part time ..Portofilio meand collection of evidence studeb ..
...

Judgement need meansebicass judge describ evidence learni view group lecture approach to assementb creating support.brefering linked learning teachybjudge outcome of learning improve teaching policy create opportunities student experience barrier learnu ..

...

-overview: policing learner :
Introduction to crime information management system :
 purpose module plan crime prevention operationel using information system in the south Africa police environment collecting explaining analizing and utiling crime information from various sources for mapping and planning the crime operationel..

* Crime prevention principles for policing :purpose : apply problem solving in crime prevention context and explain network .. illustration network..
* Applied communication in policing ..
Pratical apply theory and principle of advanced communication on strategies used within a policing environment..
* Crime prevention principle for ...: purpose students who's in crime prevention conduct an evaluation of station for human physical and human resource functionalite in the question of crime prevention and can innovation entrepreneurs approaches to crimes...
- the purpose module is to provide students safety and infrastructure audit apply and interpret pillar road safety prescribed..safety explain ..cause global ten globaj target students ..police municipality police ..pronvincd ..
* Investigative principle :
- purpose . Public service with knowledge enablt selected . Crime ambit show ..evidence applied .procedure evidence criminal law of criminal procedure and evidence .modules incorporated ..africanisation of investigat by looking aspect of Ubuntu sociaj responsibility and humanisation ..
* Crime prevey principle for traffic policing .module :
Understands the roles of differente incidence for proper deployment of resources as well saps personnel who want to improve on their incidence . management bskilk police ...- investigative principle ..
.criminal law of criminal seeks to incorporate aspect of africanisation.
- professionalism for poling ..
- Pplied research methodology in police science : understand theories or

philosophies approach and design to applied to be applied when doing praticaj research in dusciplt critical skill and knowledge for application of researche paradigm approach

** 1:aim and learning objectives.
- introduction .- the origins of community policing .
- element of community of policing .
- summary ...unity
- introduction : community policy framework in Democrat order ,legal framework ..
- the origins : according safety security 1998 demand deserve effective oriented police the new democratic saps afoot 1999 fundament transformation necessary ensure developm.
* Police framework state interrelated in order understag community we direct accountant between officikt and community creative police response interactive proactive problem oriented approach reduction of fear law enforcement official peace officer communiti change culture decentralisation band autonomous..
* Role of law ent official bevom peace officey ,law involved solet crime ...- community policing involve to have wide ranging skill . Reactive involved proactive approach to policing crime has been commited ,focusev..
*Creative law t response to the underly cause of crime .being ..introduced policing bis no longer restricted crime or visibility of origins new stragies band tactics are being introduction b..other policing related probltb.
- project have been initiated in collaboration labour..
* Element : problem oriete approach . political parti policy , government policy ,executu police
...

- Overview: assessor training learner workbook.college policing .

* Purpose of the document .
- guide to the learning material ..
-;guide to the learning materials .
- the kearniny materiai .
- learning outct .
- overview v: work based assement whin the police service ..
- section structure assessment.
- asssessment protocols ..
- activity ..

- roles and responsibilities
- what assessors need to know and do ..
- procedure and recording .
- quality assurance .
- sect - asssessment material..
- valid.
- authenty .
- current .
- sufficient .
- asssessment decission .
- reliable .
- transparent .
- defensible .
- standardisation ..

* Work based holist assesment model
- stage one planning for assessessment .
- the planning meet .
- activity
- forms of assessment material .
- categories of assessment material .
- witness testimony ..

-; examination of work product..
-:student understand learner and focus discret components ..
Information about less students understanding and learning assess skills such ..not measure but understand ability, wath is easy to test rite skills and procedures ,, on other hand constructive
- based on Piaget s and assumiy that students are able to acquire socially construct this approach ..
- is new environt students learning ..asset tools that be able the students skills such ..as open ended ..opens ..

-:epistemt requirements to us to assess ..
- have society cognitive skill solving criticaj thinking analysing data presenting ..
- educai development have improved toward more powerful learning envt reason assessessment approaches are need session both learning process and learning outcim .therefore the various communities . published the standards aboutd assessessment ..

-:the assesst standard for school ..of multiples including written .oraj and demonstration format and that oraj .. recommandatt can ..alternative assessment measure students performance and development in learning process one the alternative in education used in the assessmy of the students indivuak or group performance is Portofilio necessity of using Portofilio is emphasized by many researche virgin 2093 mine according to them Portofilio gives more reliable and dynamic data about student for teachers parents and also St unsent himself also using this ast..
Method in primary school provides getting clear information about student

and fulfilling their weaky and planing teaching progress in Turkey ..suggest that the assessment activiy should student to fulfill...-;minister educatt monevhas suggestions teacher teachers attitudes in measurements and assessment application cause problem for instance up to now being lack of pedagogicak and limited in service course ..
- basic teacher from being qualify ..beside teacher were not give ..
asssessment and resource material should be used and assesment method is give teacher initiative futhute commoner user traditional measure and assessessment method prevents finding out students skill and their development potential ...

2.1.40,, 2. ProjecOver framework qualicafition

*** Technical content presentations NQF 6 problem and solution synthesis**
EG : validat problem
- solutions or synthesis investigation
- quotation NS.
- from statutory
- regulation document integration of latest technology in perriodr cross
- in addendum rating given final
- site asy at of period pertainy to the parade project .
- academic ..- project report .
Technical detail report in terms of skill development total score =
- 2:form transmisst conductor assessment v must be completed .
- Portofilio compliance ..
- matrix overall learning experience .
- indicated in portfolio .
- assessor moderator .
- executive summary .
- content .
- learner reporting on actual with conducted .
- technical competency show in report .
- technical content presentat at NQF .
- .of the learner Portofilio documents vif the above point .must be contact Portofilio b..

- integrated pratice .
- example validation integrating integration of theory pratice :
- specification equipment from manufacture ..
Kny quotation ..integration latest text in pratice en periodicals ,cross referencing of theory ..
- addendy .5./ 10
- site asssessment at end period 5
- comment by assessor ..

- outcome comment by moderay hod
- asssessment rubric :
Learner Portofilio assessessment.
- Portofilio reg : units
- surname .
- company .
- content layout ..
- incorrect return
- initiative in devei and expani tasks :
- completion of task capacity .
- capacity
- integray .
- functionalite
- good work methods ..max
Mentor supervisor ent ..

...

Curriculum section 4

4.1

4.1 ..ATLATIC INTERNATIONAL UNIVERSITY

1. Circulum design format offline.
-Name : tshingombe Tshitadi

-4.1 .1
course title| course objectives|| course description||| activity to carry out |||| ID source of date ||||| bibliography.
-

course title	course objectives	course description	activity to carry out	ID source of	ibliography		

4.1 .12,,1- Proposal of thesis content / final project Content

1 .name of thesis
2.index
3. Introduction.
4.description .
5.general.analizing
6.current information .
7.discussion
8 conclusion.
9. Bibliography.

4.1 .12.1.Name of thesis : implementation and framework national qualification and national trade examination circulum experimental job theoretical pratical college and government policy LMS in engineering studies science electrical businesses module: case studies rsa in dhet,saqa , St peace college

2. Index: topic achieve research advance field basic field , essential filling research circulum, fundation intermediate,elementaire

3.Introduction : the core and research advanced field experience of sciences engineering electrical study and implement programme in social education and industrial trade vocational career productu sector in energy electrical and science engineering field system need to learn and re implement system information management system sector opportunity and through activities investment horizontal creation of equitable distribution: transformer science engineering and electrical product method learn capacity generative

intelligence systems of linear regression models machine learning model for specific results reported that they haveA Mon other aspirations Isreal parameter real power factor and Imagineer power factor ,, need to resolved system exper and artificial intelligence system rural development system residential dispatch deployment system and framework qualification mean regulation humain resource and material work trade design career center to make system LMS factor adaptation between robot science trade elementary work trainer training phase products and systems industrial generator entrepreneurs in same order phase assessment news field and compensation.problem ask rural development need new training order framework to qualicafition requested requalification redesign equivalents system , occupation framework system between national framework qualifications instituts and national trading sector licensed theory and practical in nature and creative abilities,
-typical evry country or landscape will be in a constant state of design system in ,,,,
Large measure unpredictable and this city or village at different paint of time ,, implementation the Grove years of failed turound ..
4**.desceiption :at the heart of solutions to framework qualicafition and national trade** implementation sub sector training trainer experiemental work place industrial more student and instituts college trade years external internal work value increase price macro economics instability Crete ,.sice accentuated by advertising shortage high inflation levek rising unemployment capacity industrial trademarks society system and materials adequately support trade training QMS system information commissioner,to under utilities in the address desterious policy design implementation ,
5. General analysis: in order to break the successful it has become social contract principle in

-4.1 .12.6 current information:
In working to formatted a trade framework qualicafition and national framework and career skill sector trade seta in same system in order to resolve problem impact real to dispatch electrical system real ,work trade design
 For the turnaround ,the following
- objective.
- the diagnosis the fundamental strategies instituts framework qualicafition national equivalent national trade international sector approval occupation council trade council engineering sector portal career design to synchronise

system adaptative sector LMS learner engineering competition grade post senior principal, engineering electrical ,tradesman wire ,cadet minim system up date successful system in design grade operational, framework award qualifition research undertake material test week conductor atom technical engineering innovation learn teach research mark method marks need to implement adaptative system , research topics circulum regulation irregularity material script, backlog system , combination system ,printer and system need to make synchronise system deploy generative job framework undercover job in next generation must going

- to discern and isolate the sicio economic environment engineering system trade safety security police , commissioner trade need to meet requirements qualicafition framework and the framework must also show in the social successful but framework it increases by outage loadshedding and social down to declined empirical experiemental in other contemporary ,the regret filled job no successful for time table printer system or computers system experiemental make design advanced research ,
-7. discussion the objective is to explore that strategies and situation where Rapide performance import. Trade theory..
- conclusion:
Whilst the field of strategy has be explored extensively in vast to trade framework qualifications need to requalification system was temporarily qualify expire system in job work sector training and regulations system industrial system need cpd to continue system and subject short and gate more skill job was slow operational field basic in basic was poorly no attandance system advance essential field job make support frame commissioner no meeting system trade retrade was not in the same ways Orders orientation industrial, imperative hard, largely ,the research interest and how a fruit full common,ground can be established.
- one of the critical virtues of the proposal thesis that it Engineering electrical science make in order to stabilize thought transfer the vei ld consensus building in ,,
- the thesis is ,, model design
Policy commissioner vs learn vs teacher vs ,, framework national trade vs company property intellectuel business electrical system need to meeting...wrong model design topic ,, research rural energy design framework , and orientation system learner teach career mentor faciltor purpose framework,leaver school need to meeting,
Design two g city design systeme economic revenue bank system portal need sector trade to work in place electrical designer b Poste trade case

research job workplace resulted was recruited need printer pool position rank no waiting

- 8 bibliography:
- tshingombe 2023_2924 < Poe's published,,educ technology, magazine net database, St peace college.
Record book completed
- web TVET dhet ,saqa wab
- alu

_____
Graduation procedure form . congratulations programme , diploma .
-1 data verification.
- grade | description| point | numeracy

2

-**4.1 .12.3,,**2. Basic questionnaire exam test
Class

_____
AIU .
-Academic evaluation questionnaire , videoconference:
-A.I.U|education|| domination|||emphasis|||| specifications||||| professional.

_____
3.curculum course ,
Assessment
-3.1.title of the subject :
 engineering electrical master
-3 2 terminanal objective of the course :
Engineering electrical master basic advance field studies assignment to able capable to define to design creativity fundamental system master low skills and knowledge value compete with each section shall be responsible for delivering the best regards in electrostatic electrodynamics electromagnetic and value of power systems.

- 3.3..brief description : the course electrical power system use or business in trade theory pratical system to master system value more stability of movement quantum mechanics transformation of electrostatic dynamic low stability,relativity of charge celerity basic and advance in trade theory electrical low Commissioning and approval: low change rules change phenomenon fundamental by stress of movement rupture breaking electrical system synchronise system asynchronous linearization system,in trade theory electrical and industrial electronics basic advance power
3.4.synopsis of content: the stability design projection system trade marketing board information system electrokinematic dynamic physical state engineering science introduction used to trade theory electrical ,manufacture process inventory low stamp system low stable loadshedding week manufacture industrial technology linearization system.
-3.5 activities of course :
Activity engineering electrical electrical experiemental subject completed log Engineering studies work 3dimension multidisciplinary approach logic of this claim: information management system in education and learn trade facilitation
Discussion log : completed theory pratical physic experiemental panel trade ,, experiemental input and output system
Activity: manipulation: test electrostatic
Conductivity expension linearization system ,dynamic system test insulation conductivity low rules , derivatives limited integrally sum resulted test system evaluation framework.
Critical source
3.5 .source of data :
Experiemental topics St peace college tshingombe ,web PG
3.6 bibliography:
Tshingombe .

_____

4.Assignment :
Title page: engineering electrical master
Electrostatic electrokinematic electrodynamics electromagnetic, stability power systems ,,,process control ,,in trade theory pratical manufacture process. Inventory claim
- index :
- page :
Cover the ,7 basic
Question course
Wath means
- diagrams: scheme correlative matrices and comparative matrices :
Answer:
- deepening of the subject : engineering electrical master low phenomenology studies vibration system.
- pratical example and cases .: engineering electrical cases study city power scheneider Eskom. Loadshedding power and industrial dtic trade career

hr

- justification:

- level experience :

- how the treated subject is seen at the local regional
-advantage and disadvantages,.
Poor efficiency and poor distribution of system ,, in trade close tendered system
Big system most important consumers system in trade increase coat award ..

No master number real system imaging

---

5. Topics.
Table of contents:
5.1: Introduction purpose of topics
Definition rationale:
5.2 description:
Components of the topics
5.3.general analyse :
- 5.4. actualization : case study.
5.5 . discussion:
5.6 general recommendation .
5.7 : suggestions.
Conclusion news perspective

- 6 topics in electrical engineering,MS ,MSEE..
- topic 6.1: digital telephonic
Introduction purpose of definition

- topic 6.2: space control system.

- topic 6.3 . advanced telecommunication.
-topic 6.4: wireless telecommunications systems.
- topic 6.5: neural networks.
-topic 6.6: computation and biologic
-topic 6.7: knowledge base system in electrical.
- topic 6.8: principle of internetworking.
- topics 6.9: optical fibre ,

- topics 6.10: signal detection and estimation theory .
- topics 6.11: digital control system.
Topics 6.12 microprocess system .
- topics 6.13 introduction to stochastic process : movement aleatoi ,signal redresseur assessvisa system band etroite , signal note .
-topic6,14 optical and ultrasound ,tomographic ,,supersoun u

Propagation linear celerity movement incidence ..
Topic : 6:15 industrial power systems process ,,
Signal input output functions power
Topics : 6:16 . signal detection and estimation theory digital images reconstruction and medical imagine
- topic 6:17, process integration
- topics 6;18.parallels computer architecture .
Topic.6:19. architecture computer
-
Topic 6:20 . power systems control stability.
Topic 6.21: electromagnetic
Topic 6,22 mathematics ,statistic probability,, calculus ,,binary
Physic ,..

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Orientation course.
- topics 6:22.communicatiin , investigation comphrensive
- topics6:23.. organization's theory Portofilio
-topics 6.24. experiemental learning , autobiography.
- topic 6.25 ,academic questions evaluation evaluation .
- topic ,6,25 fundamental of knowledge integration.
- topics fundamental principles phylosophie education.
- professional evaluation development evaluation
- development of graduation studiy
Master skill development long

approfondis kinematics system phase transition phase education system specialist personal care education facilities,, phenomenon city

4.1 .12.6..1.. Topic

. Topics.
Table of contents:
5.1: Introduction purpose of topics
Definition rationale:
5.2 description:
Components of the topics
5.3.general analyse :
- 5.4. actualization : case study.
5.5 . discussion:
5.6 general recommendation .
5.7 : suggestions.
Conclusion news perspective

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1.thesis research in electrical engineering.
-*4.1 .12.1.1.overview : conducting thesis research in electrical engineering typically involves identifying a specific problem or area of interest within the field conducting.
Experiemental,or simulation and analysing risk.
***4.1 .12.1.2. Key topic: possible research area could include power systems control system.**

Telecommunication,or embedded systems your thesis contribute new knowledge or soluyto existing challenge in the electrical and electronics.

***1.3.trade theory in electrical electronics.**

***1.4: overview this involves understanding** principle and electronics relate to electrical and electronics system installation, maintenance and safety.

*1.4. topics : you might study electrical code circuit design ,and troubleshooting technique this knowledge is essential for ensuring safety safe and efficient electrical installation in variouse..

*1.5 . advantage and disadvantage trade theory in electrical engineering.

* Innovation and development trade theory encourage competition which can lead to innovation and development of new technologies In countries to specialise in the production of certain electrical good loading to more efficient use of resources.

- economic growth: engagement in international trade can boaf economic growth by expanding market for electrical.
- knowledge transfer : trade can facilitate the the exchange of knowledge transfer trade can facilitate the exchange of knowledge and technology between countries, enhance the overall capabilities..
- disadvantages:

1.6. dependency: countries may become overly dependent on imported electrical good which can be risky if supply chain are disrupted .

-1.7.. trade theory in electrical engineering.

* Overview trade theory in electrical engineering often refer to the principles and practices related to the electrical trade : including , installation maintenance and , safety standards.

-irregularity in material design THR's could refer to issue related to the consistency and ,quality of material used in electrical .

- application , understanding how to identify and address irregularity in material is crucial for ensuring safety and performance in electrical

1.8. backlog issues:

- *overview: in the context of engineering and project management backlog issue refer to delay or outstanding task that need to beadress occured in variouse stage of a project from design to implementation ,

-1.9. key considerations: addressing backlog issues, often involves analizing task ,and efficiently this is crucial for maintenance project to timeline and ensuring successful.

-key topics : electrical : calculation understanding how to perform calculation related electrical .

System, including loaf calculation voltage. Drop and circuit design.

- Power supply system : learning about different types of power supply system , including ,AC and DC system transformers and and distribution.

-2. Interested in Educational technology can impact the outcomes of

manufacturing topics in electrical engineering Engineering.
2.1 simulation software: tools like MATLAB and Simulink allow students to model and simulation electrical ,system ,students to model and simulate electrical , system helping them understand complex concepts without the need for physical prototype.
* Online learning platform these platforms provide access to a wealth of resources including video lecture interactive quizzes and forum for discussion making easier for student to learn at their .
* Collaborative tools : technologie like cloud based . collaboration platform allow students to work together projects and instructor enhythr system taillor Education content to the individual need of students helping them grasp difficult concept ,in manufacturing and electrical engineering more.
- *industry parterneship: collaboration with industry can provide students with real world project and case studies bridging the gap between theoretical knowledge and practical application in manufacture.
- lab workshop electrical engineering .
1.circuit design and analysis ,student design and analyse various electrical circuits using bread board, simulation software.
2.microconyroller programming: workshop include.progtamming microct , (like Arduino or raspberry control device and sensor.
3.Powe system: experiemental,may involve studying power generation transmission and distribution including renewable energy source .
4.conyrol system ,student learning about feedback system.ans controle theory through pratical application and simulation.
5. Electronics prototyping : workshop may focus on building prototype of electronic devices,allowing students to apply their knowledge in real - word scenario.
6. Testing and measurement student learn to used various testing equipment such as oscilloscope and multimeter,to measure electrical parameter.
- telecommunication, workshop may cover topics like signal processing and communication system in

3. Workshop lab: aspect of trade e in electrical engineering trade theory often involves the pratical application of theoretical concept in a workshop settings.
*1. Fundamentals of electrical theory , understanding ohm low ,Kirchhoff's low and other foundation principle that government electrical circuit.
*2. Hands - on circuit assembly , student typically engagement assembling and testing various electrical circuits applying theoretical knowledge to practical scenario.
3.troubleshooting technique , workshop often include exercise diagnosis and

fixing uses in electrical system , which is crucial.
4.safety practice : emphasising safety protocol when working with electrical components and systems is vital part of any workshop.
5.usr of tools and equipment familiarisation with tools such as multimeter , oscilloscope and soldet equipment ,which are essential for electrical engineering task .
6.project based learning ,student may work on specify project that requires them to apply traditional theory concepts such a designing a simple electrical device or system .
7. Collaboration and teamwork , encourage
-information on workshop lab that cover trademarks panel wiring electrical switch one way and two ,way relay motor .
- panel wiring : basic of panel wiring learning how to wire electrical panel including understanding circuit diagrams and layout planning.
* One-way switches hands- on practice with one - way switch which control a ligth or device from a single location.
* Two way switch work with two way switch that allows control of a ligth or Devuce from two different hallways or large room.
* Relay motor ,AC and DC motor understanding the difference between AC (DC ,) motor their application and characteristics relay operational , learning how relay work ,their in controlling motor and other device , students may practice wiring relay to control ,AC and DC motors,
- practical application : hands - on project that involves wiring circuit with one way and two way switch integrating.

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6.Lab : workshop,
1. Industrial electronics.
* Overview of industrial systems:
Understanding the component and systeme used industrial electronics including sensor.actuor and controle systeme.
. installation practices : learning best practices for installation electronics system in industrial settings , including wiring ,mounting and configuration.
2.*Computer installation: hardware setup hands on experience with installing computer hardware compagny including matherboard ,power supplies and peripheral.
* Software installation: understand the process of installing operating system and necessary software for computer system.
* Safety rules : electrical safety emphasising the importance of safety protocol when when working electrical system.
- including proper use of personal protective , equipment ,(PPE) and safety handling of tools .
* Compliance with standard , learning about industrial.
* ,4 . fault finding technique , troubleshooting teach systeme Pproach diagnosing the use of flowchart.fault in electronics system including the use of flowchart and checklist ,use of diagnostic tools familiarisation with tools such as multimeter oscilloscope and tester to identify and analyse fault.

- 1* high voltage safety , safety protocol.emphasising the importance of safety when working with high voltage system including the used of personal protective equipment PPE and understanding hazard.
* Emergency procedures , training response procedure incase of electrical accidents or equipment failure.
* Power generation : type of power generation exploration various methods of power generation includ thermal hydroelectric ,wind and solar power .
* Generation , equipment hand on experience with generator, transformer and other equipment used in power generation.
3. Transmission : line design understanding the design operation of high voltage transmission line . including factor affecting.
- efficiency and reliability.
Substation operation learning,about the role of substation in the transmission system , including switching,protection .
4. Engineering trademarks, standards and certification , familiarisation with industry standard and trademarks related to high voltage equipment and systems , IEEE,IEX,ANSI,,
-Quality assurance: understanding the importance to ensure safety reliability and performance in power systems.

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Manufacturing process of electrical components.
1. Design and prototyping.
- concept development engineer design the electrical components consideration functionality material and specifications.
- prototyping: is created to test the design and functionality before mass production.
2.*material selection choosing material select material: selecting appropriate material based on electrical thermal ,and mechanical properties common material including metal , plastered and ceramic ..
3* fabrication , machining : cutting drilling and shsppings material to create the component parts ,
* Molding : for plastic components , injection molding often used to create complex shapes.
4* assembly : components assembly : parts are assembled together ,which may include soldering welding or using adhesive components like resistor capacitor and microcontroller into the assembly.

5.motoring electrical vehicles.
*5.1 overview: this area focus on the design development and operations of electric vehicle (EVS) and their components . including electric motor , batteries and chargers system.
- *5.2. key topic : you might explore electric motor design battery technology power electronics and vehicle dynamics understanding the integration of

renewable energy source and renewable energy.
-*5.3 . substation: overview , substation are design protection system design protection system, controle and maintenance practice , understanding the role substy in smart grid technology and renewable energy integration,is .

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* 5.4 . Nanotechnology:
*5.5 overview: involved manipulating matter at the nanoscale billion of meter to create material and devices with unique properties field has application across various industries electronics medicine and in the context of electrical engineering study nanoscale component as transistor sensor and energy storage devices nanotechnology enhance ,perfy .

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5.6 cellular components :
5.6.1 overview this refer to the study of t structure and function of cells structures on function cell which are the basic application in biotechnology and cellular signak memoire brand dynamic and role of protein and nuclei acids.
5.6.1 azure and machine learning Microsoft Azure is a cloud computing platform that provides a wide range of services including machine learning data storage and development to buit deployment and application machine development to build deployment and application machine python use task such as analysing medical .
*5.6.2. Assess moderator :
* Overview is responsible for overseeing and ensuring the quality and fairness of assessment in Education settings this role often involves evaluation effectiveness .
* Key topics: focus on asssessment evaluation effect.
*Key topic : focus an assessment evaluation criteria and best practices for ensuring reliability and validity in testing.
* 5.6.3. Education,didactic :
* overview : didactic in the science of teaching and learning it involved understanding how to effectively learning experience.
* Key topics: study instruction design curriculum development and teaching strategies ,styles .
5.6.4. psychopedagogy ,
*Overview: this field combines psychology to understand how psychological principle can be applied to Education practice ..
.5.6.5.: role is some who guide and supporter ,a group or individual in achieving their goals often in Educational or professional setting this role involves creating learning collaboration.
*Key skill : effective commy ,active listening conflict resolution and the ability to faster engagement skill for a facilitation .

*5.6.6 Personality care in montesory:
-overview: education setting per .

- care focuses on nurturing the individual child's development including their emotional.
* Key principles: Montessori educy emphasising respect for the child fastening independent and creating a supportive environment that encourages exploration a supportive environment that exploration and self directed learning personality care involves understanding each childs..

*6.1 Marine Engineering overview marine engineering focused construction and maintenance of ships boats and other marine vessel combined with electrical engineering it involves the electrical system that power and control .- key topics : in this field marine propulsion system electrical power generation and t ontrok system for navigation and automation engineering.
- key topics in this field marine propulsion system electrical power navigation and automation engineering.
- key topics: in this field you might study field you study marine propulsion electrical power generation and distribution control system for navigation and automation and safety systems marine systems marine electrical engineering ensure that the electrical system on vessel are efficient reliable and compliant with maritime.

- 6.2. labour machinery low.
* Overview : this area focuses on the legal regulation standards governing the use of machinery in the workplace safety ,labour rights and operationel standards.
* Key topics: you might study occupation safety.regulation machine stardard and compliance understanding low is crucial for ensuring , environment.and protecting workers .
*6.3. Bargaining:
*Overview bargaining typically refers to the negotiations process between employer workings conditions wage and other.
- key topics : you might explore collective bargaining agreement negotiation strategies and labour relations under.dynamic of bargaining is essential for mastering positive workplace.

* How to make a self assessment ,exam creating a self , assessment exam can help you evaluation your understanding of biophysics engineering concept.
1. Identify key topics, list the main topics concept you want to assess for biophysics engineering area like biomechanics medical.
2.create questions : development variety of questions types multiple choice provide several optt for each question true false simple statement that the responsibility must .
- identify as true or false.
*
-6.4 marking topics for electrical assignment exam Portofilio.
- preparing your Portofolio for an electronical assignment exam .

1.select relevant topics : choose topics that Lign with the course objectives and your interest the could area like circuit design power systems control power or renewable energy.
- organisation : your work structure your Portofolio logically you might include section for.
* Introduction :
*Of the topics cover.
* Projection: detailed description of project you completed including objective methods.
* Assignment: including key assignment that demonstrates your understanding of the material..

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7.1 .Sorting and counting learning about the mechanism that allowed these machines to sort and count bank note efficiently involves understanding the sensor and algorithm used to detect different denomination and conditions of note ,new worn or damages.
-quality controle exploring how bank note processing machine ensure that only acceptable note are circulate, removal of counterfeit or damaged not are circulate removal of counterfeit on damaged notes from.
- integration with banking system gaining knowledge integrate with bank systeme for invatory management cash flow analysis and reporting.
- maintenance and trout , understanding maintenance requirements and common issue that can arise .
- with banknoy processing machine ,.

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- 7.2 chemical engineering engineering and science are distinct yet interconnected field with engineering that focuses chemical engineering.
*Overview: this field involve the design optimization and operations of process that convert row material into valuable product chemical fuels pharmaceutical and dad,
*You might study thermodynamics , reaction engineering ,process design and separation process chemical engineering also focus on safety sustainability environment impose

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7.3. physics engineering:.- overview physic t applies principle of physic development new technology and solve engineering problem.often overlap with field like electrical mechanical and materials science.
- key topic: explore topics electromagnetic thermodynamics and quantum physics engineering work project involving.
.- science engineering.
* Overview : is Broder term that can encompasses various engineering disct that apply science principle to solve pratical problt include interdisciplinary approach .
* Key topics on focus study area science biomedical engineering often work on research and project requirements a strong foundation.

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-7.4.biophysical Engineering is an interdit field that combines principles of physic biolt and enito understand and development technologie related to .
- biomaterials: understanding the properties and applications of material used in medical device implants and tissue engineering this include studying how these materials interact with biological.
* Biomechanics: learning about the mechanical principle govern biological systems including the movement of organism and the force acting on biology tissue this knowledge is crucy for designing .
- medical imaging exploring technologie used.
- biological structure and functt MRI ,CT and ultrasound ,physic being imagi technique and theirs application in medicine.
- bioinformatics: gaining knowledge in the the computational tools and techniques used to analyse biological data including genetic sequence and protein structure this is essential for understanding complex brigicak system ,systeme biology understanding how biological systems functionalite as interaction between genes ,protein metabolism pathways this knowledge can infot the design of targeted therapies and biotechnological application

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-7.9. biophysical engineering and total productive maintenance ,tpm are important concepts in the field .
1.biophyscal engineering:
- overview: this interdisciplinary field combines principles of biological physics and engineering to develop technologie and process that improve healthcare and bioloy design of medical device biomaterials and bioprocesses .
-key topics : you might study area a biomechanics bioinformatics medical imat and tissues engineering physical Engineering work on project that involve the application of physic principle to biologist system ,such as developing prosthesis ..

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- 9.10. total productive maintenance (tpm)
* Overview: tpm is a maintenance philosophy aimed at maximizing the productivity of equipment by minimising downtime and ensui that machines operate at peak efficiy .it involve all employee in the maintenance process ,from a operator to manai
*- key topics : explore concepts such as automouse maintenance ,planned maintenance and continuous improvements ,tpm ,focuses on proactive maintenance strategies including regular inspection preventive maintenance..

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* 10. Relavtiviy ,
* Overview : relativity primarily associated with Albert Einstein include the theories of soeciat relativity and general relativity thesis theories revolutionised our understanding of space time ,and gravity .

- key topics : in engit you might study the implicai of relativity in field like astrophysics GPS techt and high speed particle physic , understanding relativity is crucial for application involve high velocities or strong gravitational.
- hydraulic and pneumatic system uses liquid,while pneumatic uses gases both system are widt used in industrial applications machinery and automation.
- key topics: you might study fluid mechanics system design control system and the component.

-9.1 simulation and modelling gaining in simulating control system to analyse their performance and Optimizer their design .
- 9.1.1.satellite communication understanding the principles of satellite communication system including hour satellite transmitted and ret signals the different types of satellite geostationary low earth arbitrary application in broadcasting.
-9.1.2. fiver optic technology learning about fiver optic communication uses light to transmit data over long distances with minimal loss you studies installation.
- 9.1.3.integration of techniques exploring how satellite and fibre optic technologie , exploring how satellite and fibre optic technologies can be integrated to provide comprehensive communication solution such as using satellites for connection in remote areas where .
-9.1.4. network design and Optimizer communication network utlize both satellite and fibre optic technologie data transmission and connectivity .
- 9.1.5 energy electro energies ,likely ref various forms of electrical energy their application in .
- *to electro energy systems . understanding the generator energy includes studying power plants , renewable energy source , like solar ,winds hydro and the electrical .
9.1.6 .energy conversion. Learning about the process involves in converting different form of energy mechanical thermal chemical. Into electrical energy and this includes studying devices like generator motor .
- *energy efficiency .exploring method .
- energy efficiency exploring method to improve the efficiency of electrical energy use in various applications including industrial processes.
* Smart grids gaining knowledge in the device management of smart grid technologies that enhances reliability and efficiency.
* Network engineering how to design efficiency and cable network including local area network LANs wide area network ,Wan's and cloud network,you learn about network topologies protocols ,and architecture.

-*network security , learning about the principles of security studying firewalls ,instrusion detection system and encryption.
-*network management gaming skill in managing and monitoring network performance , including troubleshooting issue optimizig traffic flow and ensi reliability.
- emerging technologies exploring new trend in network software ,
- definitely networks (SDN) , network functionalite virtualisation (NFV) and the internet of things .
*Certification and standards: familiart yourself with industry standard ,/ certification such .
- certificate network associate ,(CCNA) or competition network which can enhance your career.
-;electrical trade theory is an essential aspect of electrical of engineering and vocational training that focuses on the principles , practice and standard related to electrical work .
* Fundamentals principal understanding the basic concept of electricity including ohm s low Kirchhoff's low,and other principle of circuits ,voltage current and resistance.
* Electrical code and standards learning about the regulation and stars that govern electrical installation and safety practices such national electrical code ,(NEC) local building.
* Installation practices gaining knowledge in the proper technique for installing electrical systems including wiring circuit breakers outlets and ligthning fixture while ensuring compliance safety standards.
* Troubleshooting and maintenance developing skills in diagnosing and repairing electrical issues including understanding common problem and implementation effective solution.
* Safety practices , emphasising the importance of safety in electrical work practice and understand electrical hazard, instruments measurements and controle in electrical engineering is a critical reaction focused on teachiques and tools used to measure and control electrical ..
- Measurements techniques technique understand various for measuring electrical quantities such as voltage current resistance power and energy this include multimeter oscilloscope and power analyser .
- control systems . learning about the about the principles of control system, including loops control algorithm and systeme stability to design and implementation control systems to regulate electrical process.
* Sensors and transducer ,: exploring the type of sensor and transducer used to convert physical quantities.
- temperature , pressure and flow into electrical signal for application.
- data acquisition system,gaming knowledge in the designated and implementation of data acquisition system that collected and analizing data from various sensor and instruments for monitoring and control purposes.
- automation and process control understanding how, measurements controle systeme are Applied in industrial automation including programmable logic controller ,PLC and supervisory control and data

acquisition , SCADA..

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* 10. Banknote processing machines specialized device used in the banking and financial store to handle ,.. in the banking sector to handle sort.

*Currency authentication understanding the technologie used in bank note processing machines to verify the authenticity of currency note ,this includes features like ultraviolet ,UK ligth detection magnetic character recognise and infrared IR , scanning.

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10.1 telecommunication systems understanding the principles of communication system signal processing and networking design .
- Power systeme learning about the generation transmission and distribution of electrical power as well as renewable energy sources.
10.2 .neural ,
* Medical imaging using neural neural networks for image analysis in MRI ,CT scans and x- rays it improves diagnostic.
* Predictive analytics : developing model to predict patient outcomes or disease progression base on medical data

*10.3 Wearable technology : integrating neural networks into devices that monitor health metrics in real time .
* 10.4. Mathematics : advanced topics such as linear algebra calculus differential equations and status which are essential for modelling and solving Engineering problem .
*10.4.1. Physics : concept related to electromagnetic circuit theory and signal processing which or .circuciak understanding electrical systeand their applications.
-10.4.2andragogy focused on the methods and principle used in adult educay emphasising the unique need of adult contest of your master program understanding andragie help you design effive learning experience.
-10.4.3 educational philosophy involves the study of the fundamental naturel and purpose of education it can guide your approach to learning and teaching help your approach to learning and teaching help you to develop a personal philosophy that design with your goal in Engineering Education.
*10.4.5Professional theory this include the ethical legal and social implications of engineering practices as well as the responsibility of the Engineering in society it prepares you to make informed decisions in your professional career.
*10.5.4..Trade theory ,this focuses on the technical skill and knt requirements in specific engineering trade it often include hand , on training and pratical application of Engineering concepts.
*10.5.4. Industrial electronics this invot the study of electronics systeme used in industrial applications including automation control system ,and robotics sensor , actuator and the integration of electronic systems in manufacturing process.

* 10.5.5Digital system : focused on digital circuit design microcontroller and digital signal processing digital technology is applied variance field .
*Advanced circuit theory : building on basic circuit principle to explore complex circuit network theories and analysis technique.
*10.5.6 Electro magnetic including Maxwell equation wave propagation and field theory which are crucial for many.
- 10.5.5control system : delving into advanced control theory include feedback system stability analizing and control design techniques.
- 10.5.6electromechanical mechatronics is an exciting interdisciplinary field that comine mechanical engineerin.
 electronics computer.
-19.5.6 mechatronics systems systems understanding how mechanical systems integrate with electronics control and software to create intelligent system the include robotics ,Utomation and smart device .
- 10.3.controle systeme learning about the principles of controle electromechanical system loops ,sensor .
*10.4 Design and analysis ,gaining skill in design and e mechatronics focusing on their functionality efficiency.
- computer architecture.
,- 10.5. parallels computing understanding how multiple processors or core work together to perform task more efficiently including concept like parallel algorithms concurrency and synchronisation.
-10.6. computer architecture learnings about the design and organisations of compulator system including CPU memory hierarchy input ./ Output system.
- 10.7. performance evaluation , analysing the performance parallel system including metric .
-10.8 . policy development understands how to create implementation and maintenance policies that govern organisation practice especially in Engineering projects .
-*10.8. compliance and risk management learning how to ensure that police align with legal and regulatory requirements. As well how to assess and mitigate risk, association with engineering practice.
* Information system exploring how technology management policies documents management system workflow automy data analytics to tract compliance..
* 10.9 .Security systemes , understanding the design and implementation of system that protect information and asset including cybersecurity measure encryption and secure communication protocol
* 10.10.Safety engineering: learning about principle of designing system that ensure the safety of user and the environment ,including risk assessment hazard analysis ,and safety management systems..
*10.11. defense system : exploring technologie and strategic used in national defense , including surveillance systems threat detection and response mechatronics.
TV radio .
-* 10.1 media frequency : understanding the electromagnetic spectrum and

how different frequencies are used for various forms of communication including any and FM radio television broad casting

Topics ,are
-4.1 .12. 11. project management : gaining skill in managing electrical construction project including buildings budgeting schedule.
*** 11.1 .Entrepreneurs , management design management their .**
***11.2. business planning understanding how to create comphrensive business plan that outline goal strategies and financial** projections is crucial for securing funding guiding busiy operation .
* 11.3. projection management learning about tools and techniques for managu project including schedules resource allocation and risk Mt helps entrepreneurs budget.
- financial management : gaming knowledge in managing in managing finance include budgeting accounting analyse this is business decist and ensure profitability.
* Marketing and sales strategies : exploring effects marketing techniques and sale strau to attract and ret custt includes digital e.
*Technology integration , understand how to leverage technology and software solutions to streamline operational improves efficiency.
Low commercial regulation refere to minimal government intervention and oversight in commercial activities
- impact on businesens operation , understanding how low regulation can create armored flexible environment for businesses allowit for easier entry into
-**11.3.-market and dynamics : analysing how regulation effect competition innovation consumer chaise can lead to increased entrepreneurship but also raise can lead ,to increased entrepreneurship but also raise .**

- 11.4 .legal framework learnings about the legal aspects of commercial regulation including contract trade practice and consumer protection low even low , regulation environment business must navigation countries approach commercial regulation and the .
-11.5.implication for internatt : trade and investment , mining geotechnical engineering is a specialized ,field that focuses on the behaviour of earth material in mining operations.
* Geotechnical analysis: understanding the properties of soil and rock behvot under various conditions this is crucial design .
* Slope stability learn about the analyse and design of slopes in open ,pi mining and undersgroun , excavation to parent landslides.

* Ground support system , exploring the design .
* Global perspective , exploring how different countries approach commercial regut and the impliy for international trade and investment .
* Mining geotechnical engineering is a specialized field that focuses on the behaviour of earth material in geotechnical analyse , understanding the properties of soil and rock material including their strength stability and behaviour under various conditions ,this is crucial for design safe and efficient mining .
* Slope stability : learning about the analysis and ..design of slopes in open mining and underound excavation to prevent land slide and ensure the safety of workers and equipment.
* Ground support systems:.exxplot the design and implementation explore ground support system ,such as Rick bolts shot Crete and mesh to stabilize excavation collapse.
* Environmental considerations: understanding the environmental impact of mining activities and how to mitigate risk associated with with ground .
* Site investigation risks associated with ground .
Site investigation gaining skills in conducting site investigation to assess geological and inform mining design and planing.
- 11.5electrical stability understanding stability of electrical system including voltage stability frequency stability and transient stability this involves analizing how systeme response to distribution and ensuring they can return to stable operating conditions.
-transformer operation including how they step down level in power systems ,you 'll study design effict and perft characteristics.
* 11.6.1Transformer conservation , exploring method method for conserving energy in transformer operational including to, management tools management maintenance,practice and the use of energy efficiency .
*11.6.6 Transformer crucial for reducing losses and improving overall system efficiency.
* Conditt : monitoring gaming knowledge in tech monitory the health and performance of transformer including temperature monitoring insulation testing dusgnostt .
* Spatial Caltrain concept in various fields.
-11.7. spatial control system : understanding how to design implementation control system that montage the position and movement of object in a three dimensional space crucial in application .
* 11.6.Robotic and automation learning about the principles of controlling robotics system includ kinematics dynamic , exploring how to integration sensor GPS lidar camera into .

12. *Transmission system learning about the design and operation of

transmission system for radio and television inclut antennas , modulation technique and signal processing.
*12.1 Broadcasting technologie exploring the technologie used in broadcasting such as satellite communication digital broadcasting and stream.
* 12.2.Sound engineering : understanding the eof accoustict ,inclust sound wave w sound design and audio technology ,includ application in audio engineering noise control and sound system design.
* 12.3.Optic : learning about the behaviour of lights including .
- broadcasting e , exploring the technologie used in broadcasting such as satellite communication digital broadcasting and the princit of accoustict including sound wave progration sound design and audio technology application in audio e noise control sound system design.
* 12.4. Optics : learning about the behaviour of ligth including reflection refraction and diffraction.you ' ll study optical system lenses mirrors and fibre optic which are essential in various technologies including images systeme .
* Application , exploring how sound and can be integrated into Engineering solutions such imagine (ultrasound) optical communication system and sensor technology.
*12.5. Electrical machines: understanding the principles and operations of electric machines including motor generator,and transformers ,you ll learn about their design control and applicat in various industries
* 12.6.Electrotech : this field focusy on the study of electrical system and their components including circuit design power distribution and electrical safety you'll gain knot about the standard and regulations governing electrical installation , electrotechnology this encompasses the applicat of electrical and electronics technologie in various field including automation control system and reneu energy systems explore technology are used to improve efficiency and performance in Engineering applicat.
* 12.7. Radio wave propagation understand how radio wave travel through different engineering environment including factor that affect their range and quality such terroir , wether and frequency .
*12.8; communication system : learning about the design and operation of radio communication system including ,AM ,,FM and digital radio broadcasting.
* Antenna desii: exploring the principles of antenna theory and design including different types of antenna and their application in various communication system .
*12.9 signal processing: gainit knowledge in technique for processing and analizing radio signals to improve communication quality and efft.
12.10 . Radiotecht play a cruct role in telecommunication broadcasting and many modern technologies if you many modern technologies.
- random signals understanding the characteristics and analysis of signal that have a random or stochastic nature ,this include studying noise statistically .

- *12.11vibratory signal : learning about signal related to vibration which can be crucial in field like mechanical engineering structural health monitoring and accoustict you 'll study how technology interpretation vibrator signals ,to access the conditt of structural of machinery .
*Application , exploring how both random and vibration my signal are used in various applications such as in telecommunication audio engineering.
*12.12. probability theory: understanding the principles of probability including random variables probabit distribution and the low of large number thesis knowledge is essential for modelling uncertainty engineering systems.
*12.13 statistical methods: learning about about variously statistict technique for data analysis including hypothesis testing regression eand statistics inference ,these methods are to .
*12.14 . building electrical system and materials are essential component in electrical engineering.
- built electrical system: understanding the design installation of electrical system understanding the design installation of electrical system in building includy ligthi power distribution and emergency system you ll about codes and standards that government electrical installation.
12.15.electrical material study the various.material used in electriy system conductor , insulator , semiconductor you explore their property how they affect the performance and safety of electrical system.
*12.16. sustainable practices : learning about energy efficiency design and reneu energy integration in built design and renewable energy integration in building systems include solar power and smart grid .

-*12.17. construction electrical refer to the electrical system and installation that are integral to building.
*12.18. electrical design : understanding how to design electrical system for buit including power distribution ligthning and communication system how to design electrical system for building inclidiy power learn about load calculations circuit design and systeme.
* Installation practt learning about the best practices installation electrical syst in construction.lroject wiring panel installation and safety protot.
* Buit code and standards formiliaring with the local and natit code that government electrical installation in construction.

2.1.38,, 2. Projec13. * Winding on rewinding transformers and machines both DC and AC involves understanding the specification of the windings the types of machine ,and the desired ,
13.1.* Understanding the types of machines .* DC machines these include DC motor and generator which typically have -armature

windings and field windings.
- AC machine : these include ,AC motor ,like induction synchronous motor and transformser .
-2 key parameters for windings.
a winfmding specifications;
1. Number of turns (N) the number of turns in the winding affect the voltage and current characteristics.
2. Wire gauge : the thickness of the wire affect the resistance and current carrying capacity.
3.* Winding configuration Serie parallels combination depending machine type calculating wing parameters.
* For DC machine .
1.calculate the number turns the number of turns can be calculated based on the desired magnetic field strength for DC motor,back EMF(\(E\))\[E=\ frac{frac{N\cdot\Phi\cdot\cdotZ}
-_____
- to calculate aspect related to telephonic cellular telecommunication supply .
- understanding cellular telecommunication supplies cellular telecommunication supply involves the infrastructure and resource required to provide mobile communication .
* Base station : equipment that connect mobile devices to the network's.
* Backhaul the connection between base station and the core networks.
* Core network the central par of the telecommunication network that manage data and voice traffic
,##2* key calculation.
a* coverage area calculation the coverage ,area of cellular tower can estimate using the following ,\[A=\PIr^2\]
-\(A\)=coverage area (in square kilometres)
-\(r)=radius of coverage (in kilometres)
Example : if a tower has a coverage radius of ,5 km
\[A=\pi(5^2)\ approx ,,78.54\ text { km } ^2\].
b. Capacity calculation: the capacity of cellular network calculated based on the number of channels available ,traffic per channel the Erlang ,B formula is commonly ,\[c=\frac{(A^B).}.{B.} \ big / sum ..
_____
* To calculate the component of a cellular telephone system and derive relevant integral, .
1. Components of a cellular telephone system ,
A: cellular telephone system typicay consist of the components.
* Mobile station (ms) * the users device ,smart phone tower that communication with mobile stations.
* Mobile switching centre ,MSC , manages the communication base station and the core networks .
* Core network,handles data routing billing and other ,
,2 calculating key metrics.

a.coverage ,Area calculation the coverage area of a base station be estimated using .
\[A=\pir^2\]
-where .\(A\)= coverage area in square kilometres .
.\(r\)= radius of coverage in kilometres ,ex : if a base station has a coverage radius of ,3 km .
\ [A=\ pi (3^2)\ approx ,28.27\,\text ,{km} ^2\]
.b capacity calculation.

_____
To calculate the spatial transmission characteristics of a system particularly in telecommunication.
##/ understanding spatial: transmission, spatial transmission refer to how signal private ,space transmission refer to how signal propagation space ,factor distance obstacle ,and the environment.
* Free space path loss (fspl) the loss of signal strength ast travel through free space.
* Multiple path propagation the phenomenon where sign effect : the change in frequency of wave in relation to an observe moving relative to source of the wave .

2 calculating free space path loss (fspl) the free space path loss can be calculated using .
\ [text \ text { fspl } = 20\ log - { ,10}{d} 20 log { 10}(f)+32,44\] where : \ d = distance between the transmit and receiver , kilometres ,\(; f\)= frequency of the signal ,in megahertz ,example calculation ,if the distance ,\ d (d) is ,10 Kim and the frequency, (f\) is ,900MHz ,\[\ text ,{ fspl}

To calculate the properties of material used and conductor insulator and magnetic material in electrical and stereo ,system ,we can analyse their characteristic.
1. Conductor : are material resistance common conductor..
- resistivity calculation the resistivity,
(\(\ rho}) of conductor is a measure of now strongly it resist the flow of electric current the resistance ,
(\(R)) Of conductor can ,
}[R=\ rho \ frac { L}{A}\]
.\(R\)= resistance,(ohms) .
.(\rho)= Resistivity (ohm metre)
.(Li)= Length of the conductors meter
./ (A\)= Cross - sectional area ,saaremeter .
Ex . Calculation for copper wire with a length of ,2 meter and a cross ,section area of \+|\ mm^2\)
(Which is / (i\ times ,10 ^{ - 6} , m ^\)) And using the resistivity of copper (\+\ rho \ approx ., 1,67\ times . 10^ ,=-8},| omega.| Cost m.})) ,
R= 1.68 } times , 10^
To calculate the size of a winding for stepper motor .

1. Understanding stepper motors.
- a stepper motor is a types of DC motor that decides a full rotation into a number of equal step winding configuration and size are crucial for the motor .
* Number of phase : most stepper motor are either ,2 phase ,5 phase..
* Number of steps per revolution ,common value are ,200 steps ,(1.8 degree per step or ,400 steps (0.9 degree per sleep .
* Windt configuration the arrangement winding unipolar wire gauge : the thickness of wire used for the winding effects resistance ,
3. Calculating the size of the winding : determine the number of turns s , the number of turns in each winding ,calculated based motor specifications : for example ,\[N= \ frac { v} { L csoti }\ ]

-**14. measure in true.**
***1 types of measure errors measure : systematic these are considering repeatabt errors that occurred measurements system they**.
*Random error unpredictable and can vary from one measure.
- gross errors : the are large errors that occure to human .
* Calibration of instruments ,calibrat is the process of adjusting instrument to ensure its measure are accurate step for calibration.
1. Select a standard: use a reference standard.
2. Measure with the instrument take measures using the instrument.
3. Compare measurements , compare the instruments .
4. Calculate errors the errors can \[text { text error }= text { measured values \ text { true value } \]
5. Adjust the instrument if system error are found adjust .
- to perform conversion between binary hexadecimal.
Conversion between number systeme.
* To convert a binary number to decimal ,use the formuler , \ [\ text { Decima} = sun -{ I= 0}^{n}b-1\colot 2^i/] ,where \(b_1\) is the binary digital (00r1) and \(n\) is the position of the difit from the rigth starting at 0
convert ,\ (1011_21) to decimal \ [= 1\ colot ,2^) to decimal \[= 1\ colot ,2^3+0\ colotv,2^2+1\ CDOT,
2^1+1\ colot ,2^O= 8+0+2+1=11_{10}\]
-decimal to binary : to convert a decimal number to binary divide the number by ,2 and record the remainder , repeat until the Quotient record the remainder ,repeat until the Quotient is ,On
Exp : convert \ (1@-{10}\) to binary .
\ [11\div ,2=5\ qual\ text { remainder ,r= \\ ,5 \ div ,2=2\
-to calculate the size of a memory accumulator in a binary system.
1) understanding binary representation:

In a binary system ,data is represented using bits ,binary digital where bit can either 00r,1 the number determine the range ,of value that can store .
2. Memory size calculation : the size a memory accumulator based number of bit it the total number of unique represented by an \(n\) bit binary number .
\ [text { number of values } = 2^n\]
Where . \(n\)= numbers of bits.
* Example calculation: determine the size of the accumulation.
2) calculate the number of value ,\[\ text { number of values }= 2^ 8 = 256\]
This mean the accumulator can hold values from \ (01) to (255\)
(decimal ,### memory size in bytes * memory size is of expressed in byte since ,1 byte = 8 bit ,size of the accumulator in bytes is \ [text , { sizer

_____
To calculate thevenin , equivalent of a network ,short circuit current and voltage value ,
1. Thevenin theorem.
* Overview: thevenin theorem state that any linear Electrical net with voltage source and resistance can be replaced by an equivalent circuit consisting of single voltage source (1(V-{the}\)) in series with with a single resistor (\ (R-{ the}\)).
2. Step to find the in equivalent.
a identify the portion of the circuit select the portion the circuit for which
b calculate thevening voltage (\(V - (the }\))
1.open - circuit voltage, calculate the voltage across the terminal where the load was connected this is the thevenin voltage (\(V-*{the}\))
-2 method : you voltage division nodal analysing
- calculate thevenin resistance (\(R-{the}\))
- deactivated all independent source : replace independent field.
- to calculate amplification in circuits involving diodes transmission diode transistor ,and triacs understand each a analyse characteristics.
diode amplification diode are typically not used for amplification in the Sens performance signal modulation rectification signal signal modulation rectification diode current calculation.
\[I-D= L.S \ left (e^{\ frac { V-D}{ NV - T}} -1 rigth .
. \(1-D\)= diode current (A).
.\(I-S\)= reverse saturation current.
. \(V-D\)= voltage across the diode ,V
.\(n\) = ideality factor (typical between ,1 and ,2
. \ (V-T\)= thermal voltage (\approx 26\ MV) at room .
2. Transistor application transistor can use common collector thermostat common ,is common emitter amplifier .
1. Voltage gain (\ (A-C\))\[A-V=

_____
To analyse and calculate parameter in a control system we typically focus on

aspect such systems stability response.
''''''
2. Basic concepts in controle systeme.
* Open - loop control system : systeme that does not use feedback to determine if it's output has achieved the desired goal .
* Closed loop control system systeme that uses feedback to compare the actual output to the desired output.
,2 transfer function
The transfer function.
The transfer function \(H(S)\) of a control system relates the output (V(s)\<) to the input *\ (x,(s)\) in the Laplace domain : \ [H(s)= \ frac { y(s)}{x(s)}
3. Stability analysis , to determine the stability of a control system we can use the characteristics equation derivative the transfer function the characteristics equation is obtained by setting the denominator of the transfer function to zero
- for a transfer functions , ,\[H(S)=\ frac {k}{S^2+3S+2}\]
The characteristics equation is .
\[S^2+3s+2=0\] to find the root we can use ,
S=\ frac {-b\ pm \ start ,{ b^ 2-4ac}}{2a}

1. DC machines : speed (n) the speed of DC motor can be calculated using formula \[N=\ frac { V-1\ CDOT -R}{ CDOT \ Phi }\]
- where \ (N\ ) = speed in Rpm (revolution perminute .
- \ (N\)= supply voltage (v) ,
-\(i\)= armature current (A)
\ (R\)= armature resistance ,(ohm .
\(K\)= a constant that depends on .
.\(\ Phi\) = flux per pole ,(WB)
b ,torque ,(T) ,the torque procedure by DC .
T= k \ CDOT } phi \ CDOT \] ,
Where .
.\(T\)= torque ,(N.m)
\(k\)= A constant that depends .
\(phi\)= flux per pole WB .
\(|\)= armature current .

To calculate de gradient of a function and derive the integral of a Senegal,
1. Calculating the gradient of a function
The gradient of a function \(f(x,y)\) is a vector that contains all of its partial derivatives for a functionalite of two variables the gradient is given.
\[\ nabka , f=\ ,left(\fract { \ partial f) {\ partial x } , \ frac \ partial f }\ partial y \ right.

f(x,y) = x^2+x^2\]
.step ,1 calculate the partial derivatives.
.\(\ frac {\ partial f}{ \ partial x }=2x \)
.\(\ frac {\ partial f }{\ partial y}= 2y , I)
. Step 2: write the gradient \[\nabla ,f =2x,2y)\]
2. Deriving the integral of a signal ,we typically,use the fundamental theorem of calculus ,if we have a continuous function \(f(t,,)\ the integral from \(a)to \(b\)
Is given by : \[\ into$a^ b f(f) \,dt\]
-___
To calculate derivation ,both partial total double ,triple, relate ,to signal detection.
1. Partial derivatives : partial derivatives are used dealing with functionalite of multiple variable , for a functionalite.
\(f(x,y)\) the partial derivatives with respect to \(x\)
Is denoted as \(\ frac{\ partial f }{ partial x}\) and with ,
Respect to \ (y\) as \(\ frac {\ partial f }{\ partial ,y }\)
Examp : \[funct \[f(x,y)=x^2y+3xy^3\]
* Calculate partial derivatives .\(\ frac \ partial f){ partial ,x }= 2xy+3y^2\)
.\(\ fract \ partial ,f }{ partial y }{= x^2+6x6xy\)
* Total derivatives : the total derivatives account how a functionalite change with respect to all it variable.for a functionalite.
\(f(x,y)\), the total derivatives \ (DF \) is given by : \[DF = \ frac { \ partial f }{\ partial x }sx +\ frac{ \ partial }{ \ partial y } St \ ]
Using the previous : \ [DF = 2xy+ 2y^2)

_____
- to calculate the Laplace and Fourier series Fourier a random vibrational signal ,signal aleatoire vibratoire in the context break down into a few steps.
1. Fourier series : the Fourier series and cosine function for periodic function \ (ft)\) with period (t) the Fourier series is.
f(t)= a 0+\ sum ${n= 1}{\ infty}
\ left + a_ n \ cos \ left \ left + } frac { 2\ pi not }{T}
\ right) + b _ n \ sunleft (\ track { 2\2 Pu ,not { T}\, \ rigth \ rigth)\]
- pratical exercise related to electrical engineering
Exercises calculate the total resistance in a circuit problem statement have ,3 resistance.
Resistor ,R1= 100 ohm resistor ,R2= 20 ohm , resistor ,R3= 309 ohm
Formula for total resistance.
.\[R-{\ text t{ total }}= R1+R2+R3\]
. Substituting the values \[R - { \ text { total }}= 10\.\ text , { ohms }+ 20\, text{ ohms}+30\, text {ohms}\], calculating ,\[R - { \ text { total /}} = 60\\ text { ohm }\]

- to calculate the supply trade theoty impedance and resonance in a electrical circuit ,we typically deal with RLC ,(resistant inductor , overview ; of impedance and resonance.

1. Impedance ,Z in a RLC circuit the total impedance is combination of resistance ,(R) inductive reactance ,x l and capacitive reactance ,(x- c) the formula for impedance in a series RLC ,circuit is
[Z =\ sqrt{R^ 2+(x-L-X_C)^2}\]
Where _\(x_L= 2\ pi f L \ Pi .f.c\} (capacitive reactance ,
-\(X_C)=\ frac ,{1}{2\ pi.f.c}\}(capacitive reactance.
-|(fI) is the frequency in Hertz (z)
-\(L/) is the inductance in Hertz (Hz) ,
| (L /) Is the inductance in Henry(h)
-\(cl) is the capacitance in farad (f)
2* resonance occurred in an RLC circuit when the inductive reactance equals the capacitive reactance (\ (X_L= X_ C) at resonance the impedance is purely resistive and the formulation for resonance frequency form resonance frequency (\ (f - I)) is \
To the calculate the fundamental system electric power factor we need to understand relationship between real power reactive power and apparent power in electrical how to define.
1 .real power ,P owner reactive power and apparent power in electrical how to to definition real power the actual power consumed by the load measure in watt ,w
2) reactive power ,q the power the oscillator between the source and the load measured in volt amperage reactive ,varv
3 ,apparent power ,s the total power in the circuit , measure volt ampere ,Va is the combination a real and reactive power ,
- power factor calculation:
The power factor ,of is defined as the ratio of real power to apparent power ,
\ [\ text power factor ,of)}=\ frac ,{P}{s}\]
Where : .\(P\)= real power (w)
.\(S\\)= apparent power ,(VA)
apparent power calculation

apparent power calculay the apprent power can be calculated using the following formula .
\[S=\sqt{P^2+Q^2}\]
.value .real power (\(P\))=500w,
.reactive power(\Q\))=300VAR
- calculate apparent power (s)\[,S=\sqt{P^2t
- to calculate the characteristics of AC and DC machine we typically look at paramt such a peed torque and electromotive force ,(EMF) calculate these , Characteristics for both type machines .
-where .
|(a-O=| frac {1}{T} int- 0^ f(t)\dt)
.\+a-n = frac {2}{T} int_O^Y f (t) \ cos\ left (\ frac { 2\ Pi .n t}{ t } rigth \,

DT have simple square wave function.

_____

- to calculate the transformation and conservation of signal in the context of electrical signal we.

1 .signal transformation Fourier transform.

- the Fourier transform is used to convert a time domain signal into it frequency domain represent formula : transform \ F (\ omega)\(of a continuous signal \ (f(t) , e^{- j \ omega }\ dt\]

- where . \(f+ \ omega)\) = Fourier transform of the signal.

.\(f(t)\= time - domain signal .

.\ (\ omega \) = angular frequency in Radia per second ..\ (j\) = imaginary unit .

BB* Laplace transform

- the la place trans is another transformation used to analyse linear time _ invariant system formula for the la place transform \ F(S)\) of function \ (f(t)\) is \[f(s)=\ into -{O} infty } , f(t) ,, e{-st } St \]

- \(f(s)\)= Laplace transform of the signal .

- \ f(ft c)I)= time domain signal.

_____

- to calculate and understand synchroun and synchronous system, particularly in context of linearization .

1. Synchronous systems.

- in a coordinated, governed a common clock signal , in electrical synchronise system are used in digital circuit and communication system.

- example : lineare system the state space representatation .

\|[| dot { x}(t}=Ax(t)+By(t)\]\[y(t)=(x(t)+du(t)\]

Where :

-|(x(t)\)= state vector

.|(u(t)\)= Input vector

.\ (y(t) \)= output vector .

.(A\)= System .

.\(B\)= input matrix .

.|(C\) = Output matrix .

.\(D \ ) = feed forward.

_____

2.asynchronous system as asynchronous system operate without a global click signal operate independently and may not be synchronised this common in certain types of digital circuit and communication system .

- example equation for an asynchronous ,for an asynchronous linear systems the state space representatation .

|[| Dot { x} (t}= Ax (t) + B(t) \ ]\[y(t).

_____&

To calculate the integral of an amplified signal , detection of a signal and the probability of a radon signal aleatoire.

Integral of plidie signal

If you have a signal \ f(t)\) that is amplified by a constant factor \(A\) the

amplifier signal can ,be represented as \(af (f(t)\). The integral of this amplified signal over a time interval \[a,b])\[\ int_ a^baf(t)\, St = A\ into _ a^ b ,f (t) \ St
Exampt say \ f(t) = t ^ 2\) and \(A= 2\) we want to calculate the integral from \ (0\) to \ (1 }):
\[\ into _0^/2t^\, St = 2\ in_ 0^ t^2\,dt\]
Calculating the integral
\[into 0^1t 2^2\,St=\ left[\ fract { t^3}{3}\ rigth]-0^1=\
Frac {1^3}{3}_\ frac { 0^ 3}{3}=\ frac { 1}{3}\}
Thus \[\ into _ 0^ 1 ,2 T ^ 2\,dr..

_____
To calculate or design a program for artificial intelligence ,AL within an operational framework we can outline the key component and steps involved .
Program
- 1 define the operational framework : an operational framework for an all program typically includes the following components.
* Objective : clearly defined the purpose of the Al program classification predict optimisation
* Data source : identify the data source requirements for training and testing the Al model database ,APU real time data ,
* Algorithm : choose the appropriate Al algorithm based on the problem type ,supervised learning , unsupervised learning reinforced
1. Data collection and preprot
Data collection gather data from identified source this could involve wab departing using APIs or accessing database.
* Data cleaning : remove duplicate handle missing value and correct inconsistent in the data.
* Feature ent : select and transfy relevant feat that will be used in the modej .
3* model development.
* Select model choose the AI model based on the problem type for .
- for classification decision tree random ,forest ,support
vector ,machine ,neural networks.
-* for regression linear regression polynomial regression neural networks .
- training train model using the data set .
- to calculate a physical chemical plant balance we typically use the principles of mass and energy balance this,involves accounting for all input out son, accumulation of material and energy systems.structure approach to performing a mass balance physical chemical process .
2 define system : identify the boundaries of the system your are analizing this could be reactor distillation column any other unit operation in a chemical plan .
3. Identify input and output : list all the input and output system ,input can include raw material solve energy source while output / and was

-

14*. Mass balance equation : the general mass balance equation can expressed as :
\[\ text { input }-\ text { output }+\ { generation } \ text consumption}=\ text { accumulation \ ]
- for a steady state process (where accumulation is zero the equation simplified to \[\ text { input}\ text { output}\tezt Generation}-\ text { consumption}=\]
4.example calculation consider a simple chemical reactions input : A= 100kg / h , B =50 kg /h ,output ,,C= 120kg /h ..
.product..

_____
14.1 to calculate the derivative and integral related an electromechanical systems we typically analysis the system behaviour using differential equations that describes the dynamic of the system structure approach to derive the master equation and performance the necessary.
14.1. master derivatives : electrical derivatives for a simple electrical circuit with an induction ,\(L\) and a resistor \(R\/ the voltage across the inductance can be by : \ [V-L { L\ frac {Di}{St}\]
Where \(v-L)= voltage accross the inductor.
.\(|\){ current through the inductor .
- b mechanical derivatives:for a mechanical system the relationship between torque \ (\tau\) and angular velocity \(\ omega \) can be described by .
\ you = |/ frac { d\ omega }{ St}\]
- where .\ (\ tau\) = torque.
\ (\\)= moment of inertia
\(\ omega \ ) = angular velocity master

____
14.2 definition: isostatic system a system that hasjus enough support to maintain equilibrium without any redundantly it has exactly as many constraints as necessary

- hyperstatic for equilibrium leading to redundancy in constraint.
* Stability : refers to the ability of a system to return to its original state after disturbance.
* Stability analysis: for stability analysis ,we typically use method. Eingenvalue analysis for a system represented by a matrix the eingenvalue can indicate stability ,if all aigenvalue have negative real part the involved finding a lyapunov ,(function \(V(x)\) , such that \(V(X)>0\) and ,,\(\dot{(V)(X)<O\) for stability.
14.4 transformation to linear system to transform a hyperstatic system into a linear system , we can use the following step , modelling a motion ..

_____
14.6 creating a programme for a artificial intelligence ,AI , system that focuses on operational metering in electric system involves several steps , including defining the object design the architecture implementation . Algor designed the architecture implementation algoris below .
- 1 define objective
- purpose : the AI system should monitoring analyse and Optimizer electric metering operations.
14.7.
Key features:.
- real time data collection from electric meter .
- data analysis for consumption patterns.
- anomaly detection for identifying irregularity.
- predictive maintenance for meter reporting and visualisation of data.

_____
14.8. system architecture:.data source electric meter and sensor ,Day ,SQL no sQL) to store historical data .
* Processing layer , implement data processing and analysis using AI algorithm.
* User interface development a dashboard for user to visualisation data and insights.
* Data collection / use API ,,direct connection to gather data from electric meters,example shifter for data collection ,(python)
* Python,import request,def ,collect meter dentK meter data storage.
- r esponse request get ,(f" http:// API electricity meter comparable ,/ { meter _ I'd "} return response .jsob ( )

_____
14.9.Creating on expert system for network involved several steps . < Including defining the objective designed the architecture. Implementating the algorithm below is a structure approach to developing.

-* define objective :
Purpose .the expert system shouand ld assist in network management troubleshooting and optimisation.
* Key features: network monitoring and performance analysis troubleshooting and diagnostic capabilities.
- recommendations for network configuration.
User friendly interface for networking administratir.
2. System architecture , knowledge base a repository of network knowledge including rules ,fact and heir interference engine the core Logica knowledge base derive,user interface

- implementation step : knowledge base developm.protocols configuration common issues and solutions
-plain text .

If network _speed < threshold
Then
If packet _ loss >
Acceptable _ level then
Recommended _ check _ hardware.
- inference Engine implement the inference Engine to process user queries and apply the rules from from the knowledge base.
Ex code snippet , python.
Python
Class expert system
Def _ initi_ self
Self . knowledge base
- to analyse a pneumatic hydraulic vibratory system equation governing the system and performance integrals
1. Understanding the system ,A pneumatic - hydraulic
Vibrator system typically consist of
* Pneumatic components : air driven actuator or cylinder.
* Hydraulic components : fluid driven actuator or cycle

to
16.hydraulic components:fluid driver actuator or cylinder .
* Vibratory mechanism , A system that produces oscillator or vibration, oft used in applications like material.
2 . deriving equation for a pneumatic hydraulic system the dynamic described using Newton second low and the principles of fluid mechanics
_1 force balance the net force acting on the system,express as \F-{\text { net }}=F-{\ text { pneumatic}}++ ,
F-{\text { hydraulic }}- , F {\ text { damping }}-F{\ text (inertial }}
2.* Pneumatic force .the force generated by a pneumatic actuator.

_____
To derive the relationship force ,motion. ,power ,energy .
\[F= m\ CDOT a \ ] where.
.\(F\) = force (N) , | \ (m \)= mass (kg) |\(a)= acceleration ,(m/s.s)
* Work done by a force : work (\(w\) is defined as the force applied to an object time distance (\(d\) over which the force
Is applied in the direction force .
|[W= F \ CDOT d \ CDOT \ cos(\thita \]
.\(w\)= work ,joule
.\(f\)= force ,N
.(d\)= Distance,m
.\(\ theta \ ) = angle between .

,3 energy :

Kinetic energy ,(k.E) is the energy of an object du it's motion .
\[K.E= \frac {I}{2}.m.V^2\..
Where .
\(V\)= velocity (m/s)..to analizing the concept of magnetic electromagnet and electrodynamics,system in relation silence ,or damping and solenoids

_____
- understanding the concept.
- solenoid ,a coil of wire generate a magnetic field an electrical current pass through it.
* Magnetic moment ,A measure of the strength and director of a magnetic source
* Electromagnetic induction , a measure of the strength and direction of a magnetic source .
* Electromagnetic.iduction .the process by changing magnetic.field induce and electromotive force ,EMF ,in a conductor .
* Electocinectic ; refer to the motion of charged | particle a fluid under the inference of an electric field magnetic moment of solenoid..- the magnetic of solenoid.
-the magnetic moment (\(m\)) of a solenoid, \[m=n\cdot \cdot A \]
Where . \+Cn\)= number of turns per unit length ,turns / m
\(\)= current throughout the solenoid ,A
\(A\) = cross - sectional area of the solenoid,mm. Electromagnetic induction
- according to Faraday los electromagnetic the induce

_____
16.3.The term Quotient intellectual calculus is term in mathematics or intellectual ass.
- intellectual Quotient ,(iQ) ,the ,IQ is a measure of a personal intellectual abilities in relation to standardise test that assess various cognitive skill .
- IQ \[\ text {IA}=\ left (\ frac { text { mental age }}{\ text { chronological age }}\ rigth) \ time ,100\]

- mental age : the age level at which a person perform intellectual.
- chronological age : the actual >
2.Quotient in calculus.
If you have two function \ (f(x) and \(g(x)\).the quotient \ [A(X)=\ frac {f(x) {g(x)}
3.calxukating the derivative of a quotient , [fract = d}{dx{\ left (\ fract { f (x) }{g(x)\ rigth)

_____
- to analyse psychometric variance ,variance in electrical psychometric field of study concerned with theory of psychopedagogie measurements knowledge ability attides and personality traits in this psychometric test analysed staatiscally ..
2. Calculating variance is statistics measure that represent the degree of spread in set of value in the of electrical measurements.for variance : the

variance (\(} sigma ^2\)) of a set of values \(x_1,x_2\ isots ,x_n\) is calculated using formula
€[| sigma ^2= \ frac { 1}{n}\ sum _ {I=1}^{x_i_\ mu)^2\]
- \(\ sigma ^ 2\)= variance
.(X_1\) = Each inductive . observations
- formulation

_____
In electrical engineering under is crucial for analyse data especially.
1) variance : measure how a set of value differ from the mean of set it quantite the spread of the data paint .
-for a set of \(n\) observt it quantt the spread of the data .
Point formula for variance.
For a set of \(n\) observations \(x_1,x_2,\ isots ,x_ n \)
|[| Sigma ^2=\ frac {1}{n} sum_
{I=1}^{n}(x_1-\mu)^2
Where.\(\ sigma ^ 2))= variance.
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Curriculum section 5

5.1 Examination project

Master's in Artificial General Intelligence and Social Sciences

This course aims to explore the intersection of Artificial General Intelligence (AGI) and social sciences, examining how AGI developments impact society, ethics, human behavior, and socio-economic structures. Students will gain a deep understanding of both technical and social dimensions of AGI, preparing them to evaluate and influence the integration of AGI in societal contexts.

Introduction to Artificial General Intelligence

Understanding the definition, goals, and theoretical foundations of AGI, distinguishing it from narrow AI.

AGI and Human Cognition

Exploring the theoretical and practical comparisons between AGI systems and human cognitive processes.

Ethical Considerations of AGI

Analyzing ethical issues related to AGI, including its potential societal impact and moral implications.

AGI and Economic Implications

Study the potential economic consequences of AGI, including effects on labor markets and economic inequality.

AGI in Public Policy and Governance

Evaluate the role of AGI in shaping public policy and governance, including regulatory challenges.

Social Impact of AGI

Understanding the social implications of AGI, such as cultural shifts and the transformation of social interactions.

tshingombe tshitadi

Masters /engineering

Engineering electrical assessment career but sustainability

About Me

Name

tshingombe tshitadi

Follow Me On

My Education

Engineering electrical diploma

Engineering electrical nqf diploma

Work Experience

Engineering electrical assessment career but sustainability

Engineering electrical databse sarb

Skills

Professional Skills

- 80% Complete

  Trade theory electrical panel80%

My Interests & Hobbies

Engineering electrical assessment career but sustainability

Engineering

Some of my work & Certifications

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Maeve Richardson
Director of Certification

CERTIFICATE

OF PARTICIPATION

This certificate is proudly presented to:

Tshingombe Tshita

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Thesis & Publications

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AGI in Human-Machine Collaboration

Exploring how AGI can augment human capabilities and lead to new forms of collaboration.

Future Scenarios of AGI Development

Examining possible future scenarios regarding the development and integration of AGI into everyday life.

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online Retail and E-commerce in the Renewable Energy Sector

This course explores the intersection of online retail and e-commerce with renewable energy. Students will gain expertise in leveraging digital platforms to promote and sell renewable energy solutions, products, and services. The course covers market trends, customer behavior, e-commerce strategies, and sustainability practices.

Introduction to E-commerce in the Renewable Energy Sector

An overview of the e-commerce landscape specifically tailored for renewable energy products, services, and solutions.

Understanding the Renewable Energy Market

Insights into the renewable energy market, including key players, trends, and consumer preferences.

E-commerce Strategies for Renewable Energy Products

Effective e-commerce strategies tailored for marketing and selling renewable energy products online.

Consumer Behavior in Online Retail

Analyzing consumer behavior and preferences in the context of online retail for renewable energy products.

Digital Marketing for Renewable Energy E-commerce

Best practices for digital marketing in promoting renewable energy products and services online.

Sustainable Practices in E-commerce

Implementing sustainable business practices within the e-commerce model for renewable energy.

Case Studies in Renewable Energy E-commerce

Examination of successful case studies in renewable energy e-commerce businesses.

Regulatory Environment for Online Retail in Renewable Energy

Understanding the regulatory and compliance landscape impacting e-commerce in renewable energy.

Future Trends in Online Retail and Renewable Energy

Exploring future trends and innovations at the intersection of online retail and renewable energy.

Publishing and Natural Resources Management

This Masters-level course is designed to explore the intersection of publishing and the management of sustainable natural resources. It focuses on how publishing can be an effective tool in promoting sustainable natural resources management, raising awareness, and influencing policy and public perception. Students will engage in both theoretical and practical approaches to sustainable communication and publishing strategies, understanding the role of different media in shaping narratives around sustainability and natural resources conservation.

Introduction to Sustainable Natural Resources Management

This topic covers the fundamental principles of sustainable natural resource management and its importance for future generations.

The Role of Publishing in Sustainability

Explore how different publishing platforms can be used to promote sustainability and educate the public on environmental issues.

Environmental Journalism and Communication

Learn the techniques and ethics of reporting on environmental issues, and how this impacts public awareness and policy-making.

Digital Publishing and New Media

Analyze the role of digital publishing and social media in shaping discussions and actions regarding sustainability.

Content Creation for Natural Resource Management

Discover practices for creating engaging content that effectively communicates the importance of sustainable natural resource management.

Policy Advocacy and Public Engagement

Learn about the strategies for using publishing to advocate for policies supporting sustainable natural resources management.

Sustainable Practices in Publishing

Explore how publishing companies are adopting sustainable practices to minimize their environmental impact.

Case Studies in Effective Sustainability Communication

Analyze real-world examples where effective communication and publishing have contributed to successful sustainable resource management.

Masters in Supply Chain Management and Traceability

This course is designed for students pursuing a Master's degree, focusing on the integration of software engineering principles with supply chain management and traceability. The course explores how modern software solutions can enhance supply chain efficiency and transparency, leveraging advanced technologies to ensure the seamless traceability of goods from origin to consumer. Students will gain an in-depth understanding of the design and implementation of traceability systems within complex supply chains.

Introduction to Supply Chain Management

An overview of the basic concepts and components of supply chain management, focusing on the flow of goods, information, and finances.

Principles of Traceability

Understanding the importance of traceability in the supply chain, and how it ensures product integrity, safety, and compliance.

Software Engineering Basics

Introduction to software engineering principles and methodologies that are applicable to the development of supply chain management systems.

Supply Chain Digitalization

Exploring the role of digital technologies and software in transforming traditional supply chains into digital networks.

Data Management in Supply Chains

Understanding the importance of data management and analytics in optimizing supply chain operations and improving traceability.

Blockchain for Supply Chain Traceability

Exploring the use of blockchain technology to enhance transparency and traceability in supply chains.

IoT and Smart Supply Chains

Investigating how the Internet of Things (IoT) enables real-time data collection and smart decision-making in supply chains.

Security and Privacy in Supply Chain Software

Addressing the challenges of ensuring data security and privacy in supply chain management software solutions.

Case Studies and Real-world Applications

Analyzing real-world cases of supply chain management and traceability using software solutions.

Social Media Marketing for Real Estate, Rental, and Leasing

This course is designed to equip students with the skills and knowledge required to effectively leverage social media platforms for the marketing of real estate, rental, and leasing businesses. Students will learn to create engaging content, manage social media campaigns, and analyze performance metrics specific to the real estate sector.

Introduction to Social Media Marketing

Understanding the basic concepts of social media marketing and its importance in the real estate, rental, and leasing sectors.

Target Audience Analysis

Identifying and understanding the target audience for real estate, rental, and leasing businesses on social media platforms.

Content Creation for Real Estate

Strategies for creating compelling content that attracts and retains the interest of potential clients on social media.

Platform-Specific Strategies

Learning to tailor marketing strategies for different social media platforms such as Facebook, Instagram, and LinkedIn.

Social Media Advertising

An overview of social media advertising options and best practices for real estate marketers.

Engagement and Community Building

Techniques for engaging with followers and building a community around your real estate brand.

Metrics and Analytics

Understanding social media metrics and utilizing analytics tools to measure and enhance campaign performance.

Brand Reputation Management

Strategies for managing and maintaining a positive brand reputation on social media platforms.

Case Studies and Best Practices

Examining successful social media marketing campaigns in the real estate sector and identifying best practice

Advanced Telemedicine and Remote Healthcare Production

This course is designed for Master's students focusing on the integration of telemedicine and remote healthcare with media production in radio and television. It aims to equip students with the skills and knowledge necessary to produce informative, engaging, and impactful media content that addresses the growing field of telemedicine and remote healthcare delivery. This interdisciplinary course will cover media production techniques, storytelling, healthcare technologies, and ethical considerations in telehealth broadcasting.

Introduction to Telemedicine and Remote Healthcare

Understanding the fundamentals of telemedicine, its history, current trends, and the potential impact on healthcare delivery.

Television and Radio Production Essentials

Fundamental techniques in radio and television production including scriptwriting, audio/visual recording, editing, and broadcasting.

Medical Narrative and Storytelling

Crafting compelling stories that communicate complex healthcare concepts effectively to a diverse audience.

Remote Healthcare Technologies and Innovations

Exploring the latest telehealth technologies, including devices, software platforms, and innovations that enable remote healthcare.

Ethical and Legal Considerations in Telehealth Media

Understanding the ethical and legal implications of broadcasting telemedicine content, including patient privacy and data protection.

Producing Engaging Content for Healthcare

Techniques and strategies for producing engaging and educational healthcare content for radio and television.

Audience Engagement and Feedback in Healthcare Broadcasting

Tools and methods for measuring and analyzing audience engagement and feedback to improve healthcare programming.

Case Studies and Best Practices

Review and analysis of successful telemedicine and remote healthcare media projects and their production processes.

Future Trends in Telemedicine and Media Integration

Exploring future trends in telemedicine and how media can adapt to new healthcare delivery models.

Technical Writing for Technology

This course is designed to prepare students with the skills and knowledge necessary to effectively communicate complex technical information. Through a blend of theory and practical application, students will learn how to write manuals, guides, and reports in a way that is clear, concise, and accessible to various audiences within the technological field.

Introduction to Technical Writing

An overview of technical writing, its significance in the tech industry, and the roles and responsibilities of a technical writer.

Understanding Your Audience

Learn how to identify and write for different audience levels, ensuring your writing is accessible and understood by your intended readers.

Research and Information Gathering

Techniques for conducting research and gathering information, including primary and secondary data sources.

Document Design and Formatting

Explore the principles of effective document design, including layout, typography, and the use of visuals to aid understanding.

Writing Manuals and Guides

Detailed methods for writing instructional materials, such as user manuals and guides.

Using Technology Tools for Technical Writing

Introduction to software and tools commonly used in technical writing, such as content management systems, version control systems, and collaborative platforms.

Editing and Proofreading

Techniques for ensuring clarity and consistency, and methods to effectively edit and proofread technical documents.

Ethics in Technical Writing

Understanding the ethical implications and responsibilities of being a technical writer, focusing on accuracy, transparency, and avoiding plagiarism.

Effective Communication in Teams

Strategies for effective collaboration and communication within project teams, including the role of d

Masters in Vertical Farming and Urban Agriculture with Focus on Synthetic Biology

This course explores the intersection of vertical farming, urban agriculture, and synthetic biology, preparing students to innovate in sustainable food production. Students will gain theoretical knowledge and practical skills to design and implement urban farming systems that leverage synthetic biology for enhanced productivity and sustainability.

Introduction to Vertical Farming and Urban Agriculture

An overview of vertical farming and urban agriculture, their roles in modern food production, and how they contribute to sustainability.

Fundamentals of Synthetic Biology

Study the basic principles of synthetic biology, including DNA sequencing, genetic engineering, and how these tools are used to optimize plant growth.

Applications of Synthetic Biology in Urban Agriculture

Explore how synthetic biology is revolutionizing urban farming, including genetically modified organisms and engineered biosystems that improve crop yield.

Design of Vertical Farming Systems

Learn the architectural and systems design principles for creating efficient vertical farms in urban environments.

Integration of Biotechnology in Crop Production

Discuss the integration of biotechnology tools to enhance crop resilience, nutrient uptake, and pest resistance.

Environmental and Economic Impacts of Urban Agriculture

Evaluate the environmental and economic benefits and challenges posed by urban agriculture and vertical farming.

Regulatory and Ethical Considerations in Synthetic Biology

Examine the regulatory frameworks and ethical considerations associated with the use of synthetic biology in agriculture.

Future Trends in Vertical Farming and Synthetic Biology

Explore the potential future advancements in vertical farming technologies and synthetic biology app

Master's in Urban Water Supply, Sewerage, Waste Management, and Remediation Activities

This course delves into the complexities of urban infrastructure related to water supply, sewerage, waste management, and remediation activities. Students will explore the technical, environmental, and policy-related aspects of effective urban planning necessary to manage these essential services sustainably. The course equips graduates with the skills to address challenges related to population growth, urbanization, and climate change in water and waste sectors.

Introduction to Urban Water Supply Systems

Explore the components of urban water supply systems, including water sourcing, treatment, distribution, and quality management. Understand the challenges and technological advancements in managing urban water supply.

Sewerage Systems Design and Management

Learn about the engineering, design, and operational management of urban sewerage systems, focusing on sustainable practices and innovations in waste treatment and resource recovery.

Urban Waste Management Strategies

Understand the principles and methods of waste management in urban areas, addressing issues from collection to disposal, recycling, and energy recovery.

Remediation Activities and Technologies

Explore different technologies and methodologies used in the remediation of contaminated sites, focusing on both chemical and biological methods.

Policy and Regulation in Urban Water and Waste

Gain insights into the regulatory frameworks and policies that govern urban water and waste management. Explore how legislation impacts planning and operational practices.

Climate Change and its Impact on Water and Waste Management

Examine how climate change affects urban water and waste systems and explore adaptive strategies to enhance resilience and sustainability.

Sustainable Innovations in Water and Waste Systems

Discover emerging technologies and innovative practices for enhancing sustainability in urban water and waste management systems.

Integrating Water and Waste Systems into Urban Planning

Learn how to effectively integrate water supply, sewerage, and waste management into urban planning processes to create more sustainable and livable cities.

Transportation and Warehousing in Tourism Planning and Development

This course offers a comprehensive study into how transportation and warehousing play a crucial role in tourism planning and development. Students will explore the logistics, infrastructure, and management strategies required to optimize tourism supply chains, improve accessibility, and enhance the overall tourist experience. This course provides insights into transportation modes, warehousing solutions, and policy frameworks essential for sustainable tourism development.

Introduction to Tourism Logistics

Explores the fundamental principles of logistics management within the tourism sector, emphasizing its role in seamless travel experiences.

Transportation Infrastructure in Tourism

Examines the various transportation infrastructures such as airports, seaports, and road networks that support the tourism industry.

Role of Warehousing in Tourism

Discusses how warehousing and inventory management contribute to the efficiency of tourism operations.

Sustainable Transport Solutions

Covers sustainable practices and innovations in transportation that minimize environmental impact and promote eco-friendly tourism.

Tourism Supply Chain Management

Analyzes the intricacies of supply chain management specifically in the tourism sector, including challenges and best practices.

Policy and Regulations in Tourism Transport

Explores the regulations and policies affecting transportation and warehousing, and how they influence tourism development.

Innovations in Tourism Warehousing

Investigates recent technological advancements in warehousing that support tourism industry needs.

Case Studies on Tourism and Logistics

Presents case studies highlighting logistics success and challenges in various tourism destinations.

Spatial Computing in Telecommunications

This course explores the integration of spatial computing technologies within the telecommunications sector. Students will gain an understanding of how spatial data is utilized to enhance network efficiencies, improve service delivery, and innovate telecommunications solutions. Covering foundational concepts to advanced applications, the course is designed for those aiming to lead in the evolution of telecom networks through spatial computing innovations.

Introduction to Spatial Computing

This topic covers the basics of spatial computing, its historical evolution, and its current importance across various industries, with a particular focus on telecommunications.

Spatial Data and Telecommunications

An exploration of the types and sources of spatial data utilized in telecommunications, as well as methods for data collection and management.

Geographical Information Systems (GIS) in Telecom

This topic discusses the application of GIS technologies for network planning, resource optimization, and service provisioning in telecommunications.

Network Planning and Optimization Using Spatial Computing

Strategies for using spatial computing to optimize telecom network deployments and enhancements through simulation and analytic tools.

Spatial Data Analytics for Telecom

An examination of analytic techniques and algorithms that leverage spatial data to provide insights and performance improvements in telecom services.

Augmented Reality (AR) in Telecommunication Services

Understanding the role of AR technologies in enhancing customer experiences and operational efficiencies within telecom services.

5G and Spatial Computing

Investigating how 5G technology benefits from spatial computing, including precise location services and improved connectivity solutions.

Privacy and Security in Spatial Telecommunications

A look into the potential security and privacy challenges posed by spatial data in telecommunications and strate

Advanced Legal Studies in Public Administration and Safety

This course is designed for Master's level students pursuing a degree in Public Administration and Safety with a focus on Legal Studies. It aims to provide students with a comprehensive understanding of the legal frameworks and principles that underpin public administration and safety mechanisms. The course covers a range of topics, from constitutional law and administrative law to policy-making and legal ethics, equipping students with the skills needed to navigate the complex legal landscape within the public sector.

Introduction to Public Law

An overview of the principles and functions of public law, including constitutional and administrative law, which regulate the relationship between individuals and the state.

Constitutional Law and Governance

Exploration of constitutional principles and how they guide governance and the formation of public policies.

Administrative Law

Understanding the rules and regulations that govern the activities of administrative agencies of government.

Legal Frameworks for Public Safety

Examination of the legal structures and policies designed to protect public safety and maintain order.

Ethics in Public Administration

Study of ethical principles and how they apply to decision-making processes in public administration.

Public Policy and Legal Implications

Analysis of the intersection of law and public policy and the impact of legal frameworks on policy formation.

Human Rights and Social Justice

Understanding the role of law in promoting human rights and social justice in public administration.

Crisis Management and Legal Compliance

Strategies for managing crises in public administration while ensuring compliance with legal standards.

Metallurgy in Oil and Gas Production, Refining, and Transport

This course provides an in-depth understanding of the metallurgical principles and practices specific to the oil and gas industry. Students will explore the selection, processing, and performance of metals used in various segments of the industry, focusing on their application in production, refining, and transport operations. The course aims to develop a comprehensive knowledge of material selection and corrosion prevention in harsh oil and gas environments.

Introduction to Metallurgy in Oil and Gas

An overview of the role of metallurgy in the oil and gas industry, discussing the importance of material selection and analyzing common metallurgical challenges faced.

Material Selection for Oil and Gas Production

Examines criteria for selecting materials, focusing on mechanical properties and corrosion resistance required in production environments.

Corrosion Mechanisms and Prevention

Explores common corrosion mechanisms in oil and gas environments, such as sulfide stress cracking and chloride stress corrosion, and presents methods for their prevention.

Metallurgical Processes in Refining

Discusses how metallurgical processes like heat treatment and welding are utilized in refining operations to enhance material properties.

Pipeline Materials and Design

Addresses the materials and design considerations for constructing oil and gas pipelines, including the assessment of failure modes and maintenance practices.

Advanced Coatings and Surface Treatments

Focuses on the application of advanced coatings and surface treatments to protect metals used in oil and gas industry environments.

Environmental Impact and Sustainability in Metallurgy

Evaluates the environmental impact of metallurgical practices in the oil and gas industry and explores sustainable practices and innovations.

Failure Analysis and Case Studies

Explores methods for conducting failure analysis on metallurgical components and reviews real-world case studies.

Future Trends in Metallurgy for Oil and Gas

Discusses emerging trends and technological advancements in metallurgy that could shape the future of the oil and gas industry.

Integrated Water Management in Mining

This course provides an in-depth analysis of integrated water management practices within the mining industry. It covers sustainable management and conservation of water resources, focusing on balancing economic, environmental, and societal needs. The course examines technological advances, regulatory frameworks, and case studies, aimed at equipping students with the knowledge and skills necessary for effective water management in mining operations.

Introduction to Mining Water Management

Overview of water use in mining operations, including extraction, processing, and remediation. Discusses the significance of integrated water management and its role in sustainable mining.

Water Resource Evaluation and Planning

Methods for evaluating water resources at mining sites, including hydrological assessments and water balance studies. Covers planning frameworks for sustainable water management.

Water Quality Management in Mining

Techniques for monitoring and managing water quality in mining contexts, including treatment technologies and pollution control measures.

Regulatory and Environmental Compliance

An overview of legal frameworks and environmental regulations affecting water use in mining. Discusses compliance strategies and reporting requirements.

Innovation and Technology in Water Management

Examination of advanced technologies and innovative approaches in water management, such as desalination, water recycling, and smart water systems.

Stakeholder Engagement and Social License

The importance of engaging with stakeholders and communities regarding water management in mining. Covers strategies for maintaining a social license to operate.

Climate Change Impacts on Water Resources

Analyzes the effects of climate change on water availability and management in mining operations. Discusses adaptation strategies for minimizing risks.

Case Studies and Best Practices

Review of real-world examples of successful water management in mining operations. Discusses lessons learned and best practices in the industry.

Future Trends in Mining Water Management

Explores anticipated future developments in water management technologies and policies in mining.

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Advanced Manufacturing Techniques in Genetic Engineering

This course explores the convergence of manufacturing processes and genetic engineering advancements, focusing on the development, production, and application of genetically engineered products. Students will gain deep insights into techniques used to enhance manufacturing processes in biotechnology and genetic engineering fields.

Introduction to Genetic Engineering

Provides a foundational understanding of genetic engineering principles, techniques, and its application in various fields including biotechnology.

Manufacturing Processes in Biotechnology

Covers traditional and innovative manufacturing processes used in biotechnology, essential for producing genetically modified organisms and compounds.

CRISPR and Advanced Genetic Modification Techniques

An in-depth look at cutting-edge genetic modification techniques such as CRISPR, which are revolutionizing genetic engineering and manufacturing.

Ethical and Regulatory Considerations

Discusses the ethical dilemmas and regulatory framework governing genetic engineering and manufacturing processes.

Biopharmaceutical Manufacturing

Explores the manufacturing techniques specific to biopharmaceuticals produced through genetic engineering.

Fermentation Technology

Focuses on fermentation processes used in manufacturing biologically engineered products.

Scale-Up and Commercialization

Discusses the challenges and strategies involved in scaling genetic engineering products from laboratory to market.

Quality Control in Genetically Engineered Products

Examines the quality control methodologies specific to genetic engineering industries.

Future Trends in Genetic Engineering Manufacturing

Looks ahead at emerging trends and technologies that are poised to influence the genetic engineering and manufacturing landscape.

Data Processing and Hosting Services in Computer Engineering

This course is designed for graduate students pursuing a Master's degree in Computer Engineering with a focus on data processing and hosting services. It explores the advanced concepts, methodologies, and applications in managing and processing vast amounts of data, and the technological infrastructure in hosting services necessary to support such activities.

Introduction to Data Processing

An overview of data processing concepts including data collection, cleaning, transformation, and storage.

Cloud Hosting Services

Understanding cloud hosting fundamentals including types of cloud services, deployment models, and scalability.

Big Data Technologies

Exploring the tools and technologies used for processing and managing big data such as Hadoop and Spark.

Data Security in Cloud Hosting

An in-depth look into data security practices in cloud hosting environments, including encryption and access management.

Containerization and Microservices

Understanding containerization technologies like Docker and Kubernetes and their role in hosting services.

Distributed Systems

Study of distributed computing systems architecture, design, and management.

Data Warehousing and Analytics

Techniques and tools used to design data warehouses and leverage analytics for business intelligence.

Serverless Computing

Exploration of serverless computing models and their application in data hosting services.

Masters in Cryptocurrency and Blockchain Applications

This course provides an in-depth exploration of blockchain technology and digital currency. Students will learn about the foundational principles of the blockchain, the development and application of cryptocurrencies, and various real-world applications. Emphasis will be placed on developing a practical understanding of blockchain software, digital currency markets, and smart contracts.

Introduction to Blockchain Technology

Learn the fundamentals of blockchain technology, including its history, key concepts, and how it differs from traditional databases.

Cryptocurrencies: An Overview

Understand the various types of cryptocurrencies, their functions, and the economics underlying digital currencies.

Blockchain Consensus Mechanisms

Explore how consensus mechanisms like Proof of Work, Proof of Stake, and others operate within blockchain networks.

Smart Contracts

Learn about smart contracts, their capabilities, use cases, and limitations. Understand how they are deployed and managed on blockchain networks.

Decentralized Finance (DeFi)

Explore the growth of DeFi platforms and how they are revolutionizing traditional financial systems.

Blockchain in Supply Chain Management

Understand how blockchain technology is applied in supply chain management to enhance transparency and efficiency.

Regulation and Compliance in Blockchain

Study the regulatory landscape surrounding blockchain technology and cryptocurrencies, including the challenges and opportunities involved.

NFTs and Digital Assets

Explore the world of Non-Fungible Tokens (NFTs), their creation, market dynamics, and how they impact digital ownership and media.

Advanced Cybersecurity in Bibliotechnology

This course explores the intersection of cybersecurity and bibliotechnology, focusing on protecting digital library systems, data privacy, and integrity in library networks. Students will learn about cybersecurity principles and practices specifically tailored for bibliotechnology, ensuring the safety and security of digital libraries and bibliographic databases.

Introduction to Cybersecurity in Bibliotechnology

An overview of the basic principles of cybersecurity and their importance in the domain of bibliotechnology.

Threats and Vulnerabilities in Digital Libraries

Understanding the common cybersecurity threats and vulnerabilities unique to digital libraries, including unauthorized access, data breaches, and malware.

Data Privacy and Integrity in Bibliotechnology

Exploring techniques to ensure data privacy and maintain data integrity for library users and their digital interactions.

Implementing Security Policies for Digital Libraries

Developing and applying security policies and frameworks tailored for digital libraries to safeguard information assets.

Access Control in Library Networks

Examining access control mechanisms to secure user authentication and authorization within library systems.

Digital Rights Management in Bibliotechnology

Understanding digital rights management and its role in protecting digital content in bibliotechnology.

Network Security Essentials for Digital Libraries

Learn the essentials of securing library networks, combating network-based threats, and implementing robust network security measures.

Incident Response and Recovery for Digital Libraries

Strategies for effectively responding to and recovering from cybersecurity incidents within digital library environments.

Emerging Cybersecurity Technologies in Bibliotechnology

Explore the role of emerging technologies like AI and blockchain in enhancing cybersecurity in bibliotechnology.

Edge Computing in Modern Power and Energy Systems

This course provides an in-depth exploration of edge computing technologies and their integration into modern power and energy systems. Students will learn about the principles of edge computing and how it can optimize energy distribution, improve grid reliability, and enhance energy management. The course covers various topics such as distributed computing, real-time data processing, IoT in energy systems, and security challenges.

Introduction to Edge Computing

An overview of edge computing and its significance in the modern power and energy sectors. It covers the basics of edge nodes, latency reduction, and system efficiency.

Distributed Computing in Energy Systems

Explores how distributed computing operates in energy systems to enhance performance, reliability, and efficiency.

IoT Applications in Power Systems

Discusses the role of IoT devices in modern power systems for data collection, analysis, and decision-making.

Real-time Data Processing

Focuses on techniques for real-time data processing at the edge, including algorithms and architectures suited for energy systems.

Security and Privacy in Edge Computing

Examines the security challenges in edge computing environments and how they impact energy systems, with strategies for mitigation.

Edge Analytics for Energy Management

Investigates the use of edge analytics for optimizing energy management through predictive analytics and machine learning.

Energy Efficiency Optimization

Covers strategies for improving energy efficiency through edge computing technologies and smart grids.

Case Studies on Edge Computing in Energy

Presents real-world case studies to illustrate the deployment and impact of edge computing in energy systems.

Future Trends in Edge Computing for Energy Systems

Explores future developments and potential advancements in edge computing applicable to power and energy systems.

Edge Computing for Modern Power and Energy Systems

This advanced course explores the role and integration of edge computing technologies in modern power and energy systems. The syllabus covers fundamental concepts, applications, and the impact of edge computing in enhancing efficiency, reliability, and sustainability in energy systems. Students will learn through theoretical insights and practical applications, supplemented by interactive resources.

Introduction to Edge Computing

Understanding the basic concepts and architecture of edge computing, its significance in reducing latency and improving real-time processing capabilities in power systems.

Role of Edge Computing in Smart Grids

Exploring how edge computing supports smart grid operations including demand response, grid stability, and energy distribution management.

Edge Computing for Renewable Energy Integration

Analyzing the integration of renewable energy sources into power grids using edge computing to enhance efficiency and sustainability.

Data Management and Security in Edge Computing

Understanding how data is managed and secured in edge computing systems, with a focus on the challenges and solutions in power systems.

Machine Learning Applications on the Edge

Investigating the applications of machine learning in edge devices to predict and optimize energy consumption and distribution.

Case Studies in Edge Computing for Energy Systems

Reviewing real-world case studies to understand the implementation and outcomes of edge computing in energy systems.

Challenges and Future Trends

Discussing the current challenges faced by edge computing in energy systems and predicting future trends and technological advancements.

Masters in Cyber-Physical Systems and Information Technology

This course provides an in-depth understanding of Cyber-Physical Systems (CPS) within the realm of Information Technology. By exploring the convergence of physical and cyber domains, students will gain insights into the integration, design, and application of CPS in various sectors. Through a combination of theoretical studies and practical assignments, this course aims to equip students with the skills necessary to innovate in this rapidly evolving field.

Introduction to Cyber-Physical Systems

This topic covers the basics of CPS, including definitions, history, and key concepts that distinguish CPS from traditional IT systems.

Architecture of CPS

Explore the architecture of CPS, focusing on sensors, actuators, control systems, and the role of internet of things (IoT) in CPS.

Networking and Communication in CPS

Understand the communication protocols and networks that enable interaction between cyber and physical components within CPS.

CPS Security and Privacy

This topic delves into the security challenges in CPS and discusses methods to ensure data integrity and privacy.

Machine Learning in CPS

Examine the role of machine learning in optimizing the performance and decision-making processes within CPS.

Real-Time Systems and CPS

Learn about the real-time requirements of CPS and the design considerations necessary to meet these requirements.

Simulation and Modeling in CPS

Explore tools and methodologies for simulating and modeling CPS to optimize design and operation.

Applications and Case Studies of CPS

Analyze various applications of CPS in industries like healthcare, automotive, and smart grids with real-world case studies.

Masters in Distributed-Ledger Technology Applications in Educational Technology

This course explores the integration of distributed ledger technologies (DLT), such as blockchain, into educational technology platforms. Students will learn about DLT concepts, their applications in the management and dissemination of educational content, secure credentialing, and enhancing educational efficiencies. The course equips students with both theoretical understanding and practical skills to innovate within the educational sector using advanced DLT methodologies.

Introduction to Distributed Ledger Technology

An overview of distributed ledger technology including blockchain, its history, and basic principles that empower decentralized systems.

The Need for Distributed Ledger Technology in Education

Examine the challenges in the current educational systems and how DLT can address issues around data security, integrity, and cost-efficiency.

Blockchain for Secure Credentialing

Explore how blockchain can be used for secure credentialing, providing reliable storage and easy verification of educational credentials.

Smart Contracts in Educational Transactions

Learn about smart contracts and how they can optimize and automate payment systems, enrollments, and certifications in education.

DLT-based Learning Management Systems

Investigate the potential of DLT to revolutionize Learning Management Systems (LMS) by enabling decentralized data management and analytics.

Privacy and Data Security in DLT

Understand the privacy considerations and security protocols of DLT systems and how data privacy is enhanced within educational contexts.

Case Studies of DLT in Education

Review real-world implementations of DLT in education and analyze the outcomes and lessons learned from these case studies.

Future Trends in DLT and EdTech

Delve into the emerging trends and future directions of DLT applications in educational technology.

Master's in Adult Education Services

This course is designed for educators and professionals aspiring to excel in the field of adult education. It focuses on teaching strategies, curriculum design, assessment methods, and the unique needs and challenges faced by adult learners. The course aims to prepare students to effectively design and implement educational programs that cater to adult learners in various settings.

Introduction to Adult Education

An overview of the principles and practices in adult education, including historical perspectives and modern developments.

Theories of Adult Learning

Exploration of key theories such as Andragogy, Transformative Learning, and Experiential Learning that inform adult education practices.

Curriculum Design for Adult Learners

Techniques and strategies for developing effective curricula tailored to adult learners' needs and goals.

Assessment and Evaluation in Adult Education

Methods for assessing adult learners' progress and program effectiveness, including formative and summative evaluation.

Technology Integration in Adult Learning

Utilizing digital tools and technologies to enhance adult learning experiences.

Diversity and Inclusion in Adult Education

Addressing the diverse backgrounds, identities, and learning styles of adult learners.

Motivational Strategies for Adult Learners

Strategies to engage and motivate adult learners, fostering a positive and productive learning environment.

Professional Development for Adult Educators

Resources and strategies for ongoing professional growth and development in adult education.

Quantum Computing in Systems Engineering

This course provides an in-depth exploration of quantum computing principles and their applications within the field of systems engineering. Students will gain a comprehensive understanding of both theoretical foundations and practical implementations of quantum technologies in designing and optimizing complex systems.

Introduction to Quantum Computing

An overview of the principles of quantum mechanics that form the basis of quantum computing technology, including qubits, superposition, and entanglement.

Quantum Algorithms

Detailed study of key quantum algorithms such as Shor's algorithm and Grover's algorithm, and their implications for solving complex computational problems.

Quantum Gates and Circuits

Exploration of fundamental quantum gates and the construction of quantum circuits to perform computational tasks using qubits.

Quantum Information Theory

Understanding the theoretical underpinnings of how quantum mechanics enhances information processing capabilities in systems engineering.

Quantum Computing Platforms

Introduction to current quantum computing platforms and hardware, including superconducting qubits and trapped ions.

Quantum Programming Languages

Learning and applying quantum programming languages such as Qiskit, Cirq, and Q# to develop quantum algorithms.

Applications of Quantum Computing in Systems Engineering

Investigation of potential applications of quantum computing in systems engineering, including optimization, simulation, and cryptography.

Challenges and Future of Quantum Computing

Discussion on the current challenges facing the field of quantum computing and potential directions for future research and development.

Quantum Supremacy and its Implications

Examination of the concept of quantum supremacy and its potential to revolutionize computing systems.

Neurotechnology in Educational Technology

This course explores the intersection of neurotechnology and educational technology, focusing on how advances in brain research and interface technologies can enhance learning experiences and outcomes. Students will delve into theoretical aspects, practical applications, as well as ethical implications of utilizing neurotechnology in education.

Introduction to Neurotechnology

This topic provides a foundational understanding of neurotechnology, including its history, development, and current state of the art. Students will learn about various devices and technologies used in neurotechnology.

Neuroscience Basics for Educators

An overview of essential neuroscience principles necessary for understanding how neurotechnology can be applied in educational contexts, focusing on brain structure and function in learning.

Brain-Computer Interfaces in Education

Examine how Brain-Computer Interfaces (BCIs) can be used to facilitate learning, including current applications and future possibilities.

Cognitive Load Theory and Neurotechnology

Understand how cognitive load theory informs the design of neurotechnology applications in learning environments.

Neuroscience-Based Adaptive Learning Technologies

Explore how adaptive learning technologies informed by neuroscience can personalize and enhance educational experiences.

Ethical and Social Implications

Consider the ethical and social implications of using neurotechnology in educational settings, including privacy concerns and consent.

Case Studies in Neurotechnology Education

Review real-world case studies where neurotechnology has been applied within educational contexts and assess their outcomes.

Future Trends in Neurotechnology for Education

Discuss and predict future trends in the deployment of neurotechnology for educational purposes, driven by technological and scientific advancements.

Robotic Process Automation in Electrochemical Engineering

This course explores the integration of Robotic Process Automation (RPA) within the field of Electrochemical Engineering. The course provides a comprehensive understanding of how automation technologies can enhance

efficiency, accuracy, and productivity in electrochemical processes, ranging from battery manufacturing to fuel cell production. Students will gain skills in designing, implementing, and managing automated processes in electrochemical settings.

Introduction to Robotic Process Automation

This module introduces the fundamentals of RPA, covering its history, benefits, and applications across various industries.

Fundamentals of Electrochemical Engineering

Explore the core principles of electrochemical engineering, including electrochemistry, materials science, and process design.

RPA Tools and Platforms

Gain insights into popular RPA tools and platforms like UiPath, Automation Anywhere, and Blue Prism. Understand their capabilities and use cases.

Automating Electrochemical Process Controls

Study the application of RPA in automating the control systems within electrochemical processes, improving precision and efficiency.

Data Collection and Analysis in Electrochemical Systems

Learn how RPA can facilitate data collection, analysis, and reporting in electrochemical systems, enhancing decision-making capabilities.

Machine Learning and RPA in Electrochemical Engineering

Explore the intersection of machine learning and RPA in electrochemical engineering for predictive maintenance and process optimization.

RPA Implementation Challenges and Solutions

Discuss the challenges faced during the implementation of RPA in electrochemical engineering and explore potential solutions.

Case Studies and Industry Applications

Analyze various case studies to understand how RPA has been applied successfully in the field of electrochemical engineering across different sectors.

Integrating Educational Technology in Renewable Energy Studies

This course is designed for master's students interested in combining the fields of renewable energy and educational technology. It explores the role of technology in educating and informing about renewable energy, examining innovative teaching tools and strategies. Students will learn how to develop technology-driven educational materials and experiences aimed at increasing awareness, understanding, and adoption of renewable energy concepts.

Introduction to Renewable Energy

An overview of various renewable energy sources, including solar, wind, hydroelectric, and geothermal. Discussions will include the benefits and challenges of each type along with their current global usage.

Educational Technology Tools

Examines the digital tools and platforms available for creating engaging learning experiences in the field of renewable energy.

Designing Interactive Learning Modules

This topic covers the methodologies and best practices for designing interactive and immersive learning modules using educational technology.

Gamification in Renewable Energy Education

Explores the concept of gamification and how game-like elements can enhance learning in renewable energy courses.

Virtual Labs and Simulations

Discusses the role of virtual labs and simulations in teaching complex renewable energy concepts.

Assessing Learner Outcomes in Technology-Driven Curriculum

This topic focuses on developing assessment strategies for technology-enhanced renewable energy education.

Case Studies in Renewable Energy Education

Analyzes real-world examples of successful renewable energy educational programs and the role of technology in their delivery.

Challenges in Integrating Technology and Renewable Energy Education

Addresses common challenges faced when integrating technology into renewable energy education and potential solution

Wholesale Trade Management in Industrial Engineering

This course is designed for students pursuing a Master's degree in Industrial Engineering with a focus on wholesale trade. It will cover the essential aspects of wholesale trade management, including supply chain dynamics, inventory control, logistics, procurement, and market analysis. The course will blend technical engineering concepts with business strategies to enable students to effectively manage and innovate within the wholesale trade sector.

Introduction to Wholesale Trade

Explore the fundamentals of wholesale trade, its role in the supply chain, and the economic impact on industrial markets.

Supply Chain Dynamics

Understand the complexities of supply chain management, including network design, integration, and leveraging technology for efficiency.

Inventory Control Methods

Study various inventory management techniques, such as Just-In-Time, Economic Order Quantity, and ABC analysis to optimize stock levels.

Logistics and Distribution

Examine the logistics involved in wholesale trade, focusing on distribution networks, transportation management, and warehousing solutions.

Procurement Strategies

Learn about procurement processes and strategies, vendor selection, and relationship management to secure effective supply sources.

Market Analysis and Forecasting

Study techniques for market analysis, trend observation, and forecasting methods to drive strategic decisions in wholesale trade.

Risk Management in Wholesale Trade

Analyze risk management principles, identifying potential risks in the wholesale supply chain and developing mitigation strategies.

Regulatory and Ethical Considerations

Explore the regulatory landscape affecting wholesale trade and the ethical considerations of operating within the sector.

Advanced Wireless Communications

This course explores the fundamental principles and advanced techniques of wireless communications, designed for students in electronic engineering. It covers critical concepts, system designs, and the latest advancements in wireless technologies to prepare students for careers in the telecommunications industry.

Introduction to Wireless Communications

Overview of wireless communication systems, historical developments, and contemporary applications.

Radio Frequency Fundamentals

Exploration of radio frequency (RF) spectrum, key RF principles, and their application in wireless communication.

Wireless Signal Propagation

Understanding the behavior of wireless signals over various media and environments, including path loss, fading, and interference.

Multiple Access Techniques

Survey of multiple access schemes including FDMA, TDMA, CDMA, and OFDMA, which enable multiple users to share the same frequency band.

Wireless Networking and Protocols

Introduction to wireless network design, including protocol layers, network architectures, and routing protocols.

Cellular Systems and 5G

In-depth analysis of cellular network architecture, with a focus on the evolution from 1G to 5G, and future trends.

Antenna Theory and Design

Study of antenna characteristics, types, and their utilization in wireless communication systems.

Wireless Security

Exploration of security challenges and solutions in wireless communications, including encryption and authentication methodologies.

IoT and Wireless Sensor Networks

Examination of Internet of Things (IoT) concepts, architectures, and the role of wireless sensor networks in IoT implementations.

Advanced Electrical Engineering in Construction and Civil Engineering

This course provides an in-depth understanding of electrical engineering principles and their applications in construction and civil engineering. Students will learn about the integration of electrical systems within construction projects, the challenges of implementing sustainable energy solutions, and the latest technologies in the field. Emphasis is placed on practical analysis, design, and problem-solving skills necessary for modern construction projects.

Fundamentals of Electrical Systems in Construction

Overview of electrical systems essential in construction projects, including power distribution, lighting, and wiring systems.

Electrical Safety Standards and Codes

Detailed study of electrical safety standards, codes, and regulations specific to construction sites.

Integration of Electrical Systems in Building Design

Techniques for integrating electrical systems with architectural and structural frameworks in buildings.

Sustainable and Renewable Energy Technologies

Exploration of sustainable and renewable energy technologies applicable to construction projects.

Smart Grids and Intelligent Networks

Study of smart grid technologies and their application in modern urban infrastructure.

Electrical System Design and Simulation

Practical approaches to the design and simulation of electrical systems for construction projects using industry-standard software.

Power Quality and Energy Management

Analysis of power quality issues and energy management strategies for improved efficiency.

Electrical Systems in Infrastructure Projects

Examination of the role of electrical engineering in large-scale infrastructure projects, such as transportation and water systems

Electrical Systems in Construction and Civil Engineering

This master's level course is designed to bridge the fields of construction and civil engineering with electrical engineering principles. Students will learn to integrate electrical systems into construction projects effectively, ensuring safety, efficiency, and innovation in modern infrastructure.

Introduction to Electrical Systems in Construction

Overview of electrical systems integration in construction projects, considering design, installation, and maintenance.

Power Distribution in Buildings

Explore the principles and challenges of power distribution systems in modern buildings, including load assessments and distribution panels.

Lighting Systems and Design

Study the design and implementation of efficient lighting systems in commercial and residential buildings.

Electrical Safety Standards and Regulations

Learn about international and local electrical safety standards and regulations pertinent to construction projects.

Sustainability in Electrical Engineering

Understand sustainable practices and technologies, such as solar power and energy efficiency in construction.

Smart Buildings and IoT Integration

Examine the incorporation of smart technologies and IoT in building systems for improved energy management and automation.

Electrical Load Analysis and Estimation

Learn methods to analyze electrical loads and estimate demand for optimal system design.

Integration of Renewable Energy Sources

Explore the potential of integrating renewable energy sources into construction projects and urban environments.

Project Management in Electrical Engineering

Develop skills in managing electrical engineering projects within the construction industry, focusing on timelines, budgets, and resource allocation.

Doctorate in Specialist Engineering Infrastructure and Contractors: Electrical Engineering

This advanced course is designed for students pursuing a Doctorate degree in Specialist Engineering Infrastructure and Contractors with a focus on Electrical Engineering. The course aims to equip students with in-depth knowledge and practical skills necessary for the design, implementation, and management of electrical infrastructure projects. Students will explore contemporary challenges, innovative solutions, and emerging technologies in electrical engineering.

Advanced Power System Analysis

Exploration of power flow analysis, fault analysis, and stability assessment in large-scale electrical power systems with a focus on real-world applications.

Renewable Energy Systems

An in-depth examination of renewable energy technology integration, focusing on wind, solar, and hydroelectric power systems.

Electrical Infrastructure Design and Management

Comprehensive overview of electrical infrastructure planning, design methodologies, and management practices for efficient operation.

Smart Grids and IoT Applications

Study of smart grid technology, IoT applications in electrical systems, and their impact on efficiency and sustainability.

High Voltage Engineering

Analysis of high voltage engineering principles, equipment, and testing methodologies in power transmission.

Project Management in Electrical Engineering

Principles and practices of effective project management tailored to electrical engineering projects and infrastructure.

Energy Policy and Ethical Considerations

Examination of energy policies, regulatory frameworks, and ethical considerations impacting electrical infrastructure projects.

Sustainable Electrical Engineering Practices

Strategies for incorporating sustainable practices in the planning, design, and execution of electrical engineering projects

Admission Ready - Completing your application - Atlantic International University

Inbox

Roberto Aldrett - AIU 6:31 AM (10 hours ago)

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Atlantic International University
A New Age for Distance Learning

Admissions Department - Atlantic International University

From: **Roberto Aldrett**, Communications Coordinator

1/28/2025

tshingombe tshitadi

Applying for: Masters of

Johannesburg South Africa

Dear tshingombe

I am writing to let you know that your acceptance and placement offer to you is set, your Virtual Campuses (Academic and MYAUI) have been created. I want to express to you how delighted the AIU community is that you will be joining a very selected number of students from more than 160 countries of the world. Your placement for the Masters of will be secured after we received your registration fee that is due on **31st of January, 2025.**. Remember at AIU, registration / application fee and first tuition is all the same (One small single payment).

To understand the real meaning of AIU
Degrees: https://vimeo.com/549087436/34bc313fc5

To complete your application:

- Make sure you have read your Admission letter and payment plan.

- Send us your CV and all academic documents. It is very important!

- Do your application payment. In case of admission, it will be applied as your registration fee.

Application Fee: 150 USD

You can do a direct payment with your **Visa, Master Card, or American Express Credit or Debit Card** here:

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Or you can use the following methods of Payment:

1. **WIRE TRANSFER**

Citi Bank

Name of the Account: Atlantic International University Account Number: 9137954440 ABA/Routing Number: 021000089 (International)

ABA/Routing Number: 266086554 (US /Domestic) SWIFT Code: CITIUS33 Address of the Bank: 399 Park Avenue, New York, NY 10043

PLEASE IF YOU DO AN ONLINE TRANSFFER FROM ACCOUNT TO ACCOUNT PLEASE SEND THE RECEIPT AND YOUR COMPLETE INFORMATION IN ORDER FOR US TO POST YOUR PAYMENT CORRECTLY OR SEND YOUR RECEIPT BY EMAIL TO roberto @aiu.edu or FINANCE@AIU.EDU

1. **PayPal:** If you have a PayPal account use the following information:

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E-mail: admissions@aiu.edu

Please make sure you add the 4% PayPal charges when sending a payment. Please upload your receipt through your student section.

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2. **Zelle Payments**

E-mail: finance@aiu.edu

Please upload or email your confirmation receipt for us to verify your payment.

3. **Klasha (Africa including South Africa, Nigeria, Kenya, Ghana, Zambia, and Tanzania)**

From the convenience of your mobile device, KLASHA will allow you to send payments using a local credit card or local transfer to AIU. This method will help you reduce fees and save time when paying your fees.

If you would like to pay via Klasha download our mobile app on **Google play store** **or** **IOS**

and set up the account. After which you can fund the account and use the money in the wallet to make transactions.

If you already to pay, please click on the link below:

Click to Pay Now: https://aiusecurepayments.org/klasha/

4. **Cryptocurrency** (Bitcoin, Ethereum, DAI, US coin, etc.)

To learn more about this payment method, we encourage you to watch the video : https://vimeo.com/657490143/09955932e8

If you would like to use this payment method, please click on the link below, scroll to the bottom of the tuition page and select your payment method.

https://www.aiu.edu/tuition/

5. **Western Union: Quick Collect**

Name: Atlantic International University

Company Code: ATLANTICUNIVERSITYHI

Account Number: Provisional Student ID

The transaction fee will vary from country to country.

IMPORTANT: Take in consideration that we are not a person, but an institution. So, you can't do a person to person transaction but a Quickpay or Quick Collect. WESTERN UNION QUICKPAY or QUICK COLLECT is the option to pay for your tuition. Sometimes you have to insist the Western

Union representative that you need to do a Quickpay or a Quick Collect.

We look forward to helping you with your studies. I appreciate your confidence in me and am very happy that you are joining AIU.

Sincerely,

Roberto Aldrett - roberto@aiu.edu
- Communications Coordinator -
Atlantic International University - http://www.aiu.edu
900 Fort Street - 905, Honolulu Hawaii 96813. USA

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2. How can you complete your enrollment?

After completing your online application, you will be able to pay your enrollment fee online by card or PayPal, or receive payment instructions for Wire Transfers and Western Union

3. Would you like to learn more about your program?

Complete the application to receive a complete list of the most common questions and answers regarding your studies at AIU, such as program length, courses, mode of study and more.

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You will receive your Admissions Letter after your application has been reviewed.

2. Complete Your Enrollment Fee Payment - Pending

This step must be completed in order to continue to Step 3. You will receive instructions according to your selected payment method after receiving your Admissions Letter.

3. Upload Your Previous Academic Diploma - Pending

After completing Steps 1 & 2, you will receive the Orientation Package with guidelines on how to submit your previous academic diplomas and transcripts on your student section.

4. Begin Your Studies - Pending

This is the final step where you will be able to select your courses and begin your studies at Atlantic International University.

If you have any questions, feel free to contact us or visit our website for more information.

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Access your online Student Section and start studying your Masters Degree in electrical engineering by completing your AIU enrollment and gaining immediate access to your online student section today!

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Payment Plan Summary:

Degree: Masters in electrical engineering

Enrollment Fee: $150 US

If you submit a successful payment with a credit card, you will receive a payment confirmation email and enrollment fee will be processed much faster and receive immediate access to your Online Student Section!

Dear tshingombe tshitadi,

We received your request to apply for a Masters partial scholarship at Atlantic International University on 12/17/2024 10:49:16 PM

Please update your application below including the financial part to see what max scholarship you qualify for in the next 48 hours.

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We're excited to grant you exclusive live class access this week!.

This special opportunity allows you to log in to any class you choose, all week long, and experience firsthand the valuable knowledge and skills you'll gain when you enroll in your Masters program.

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Curriculum section 6:

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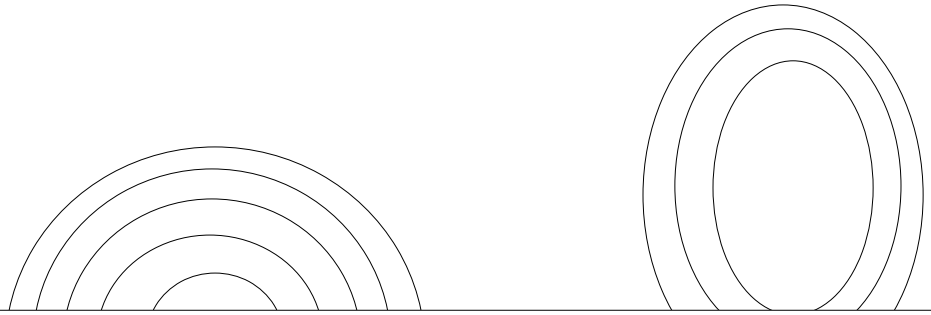

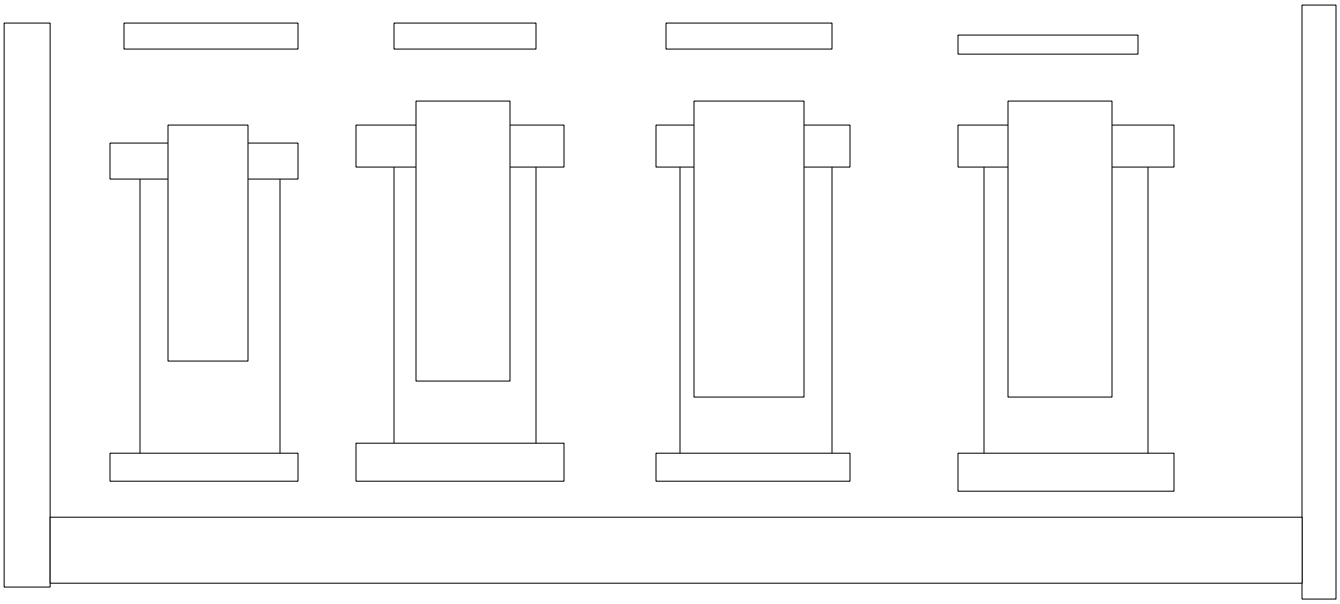

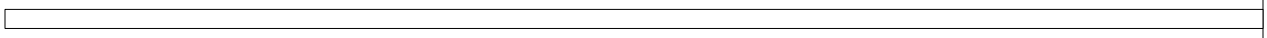

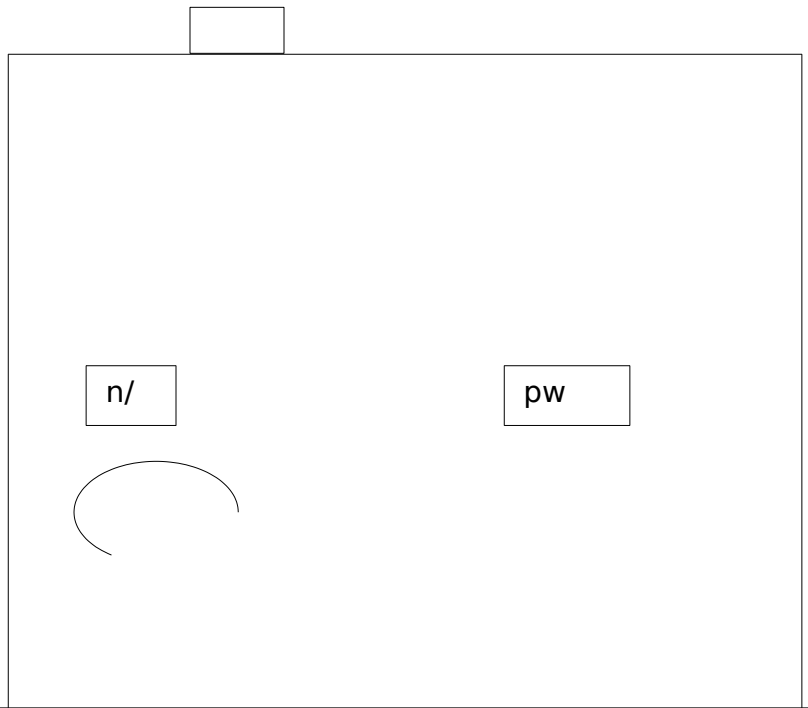
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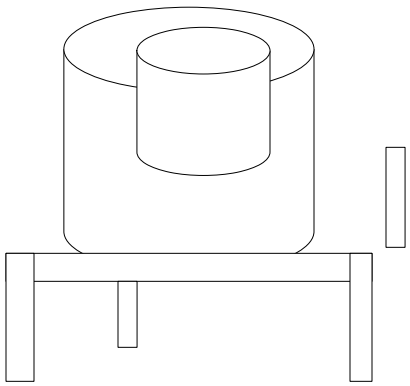

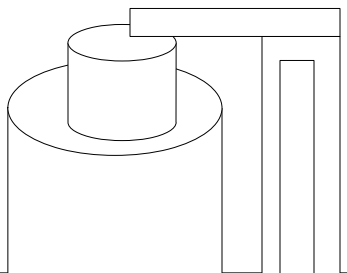

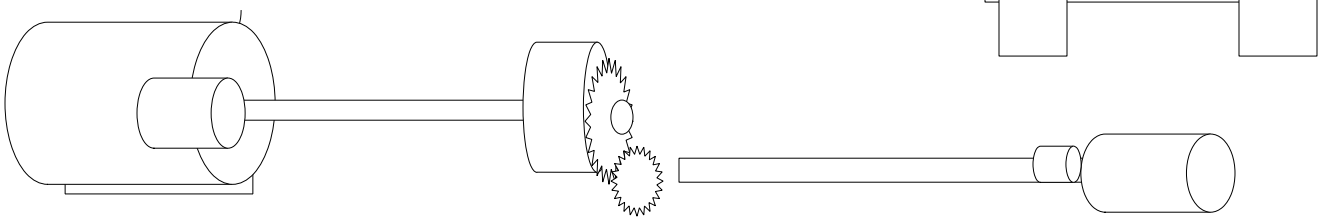

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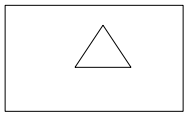

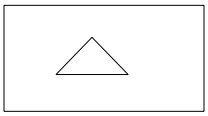

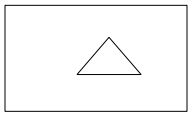

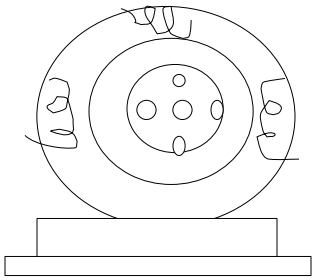

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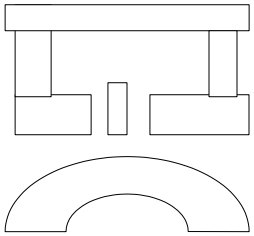

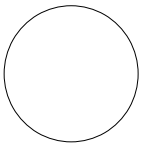

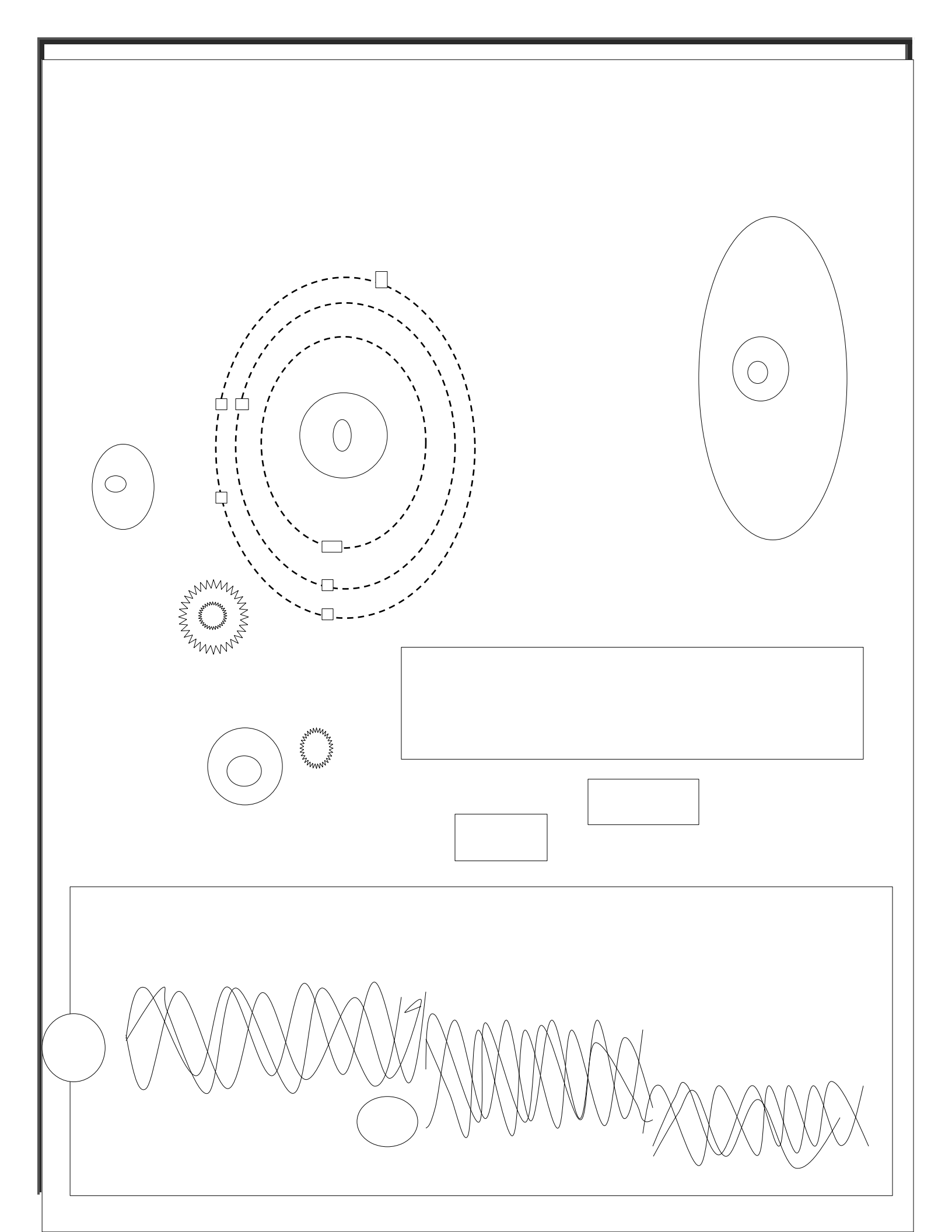

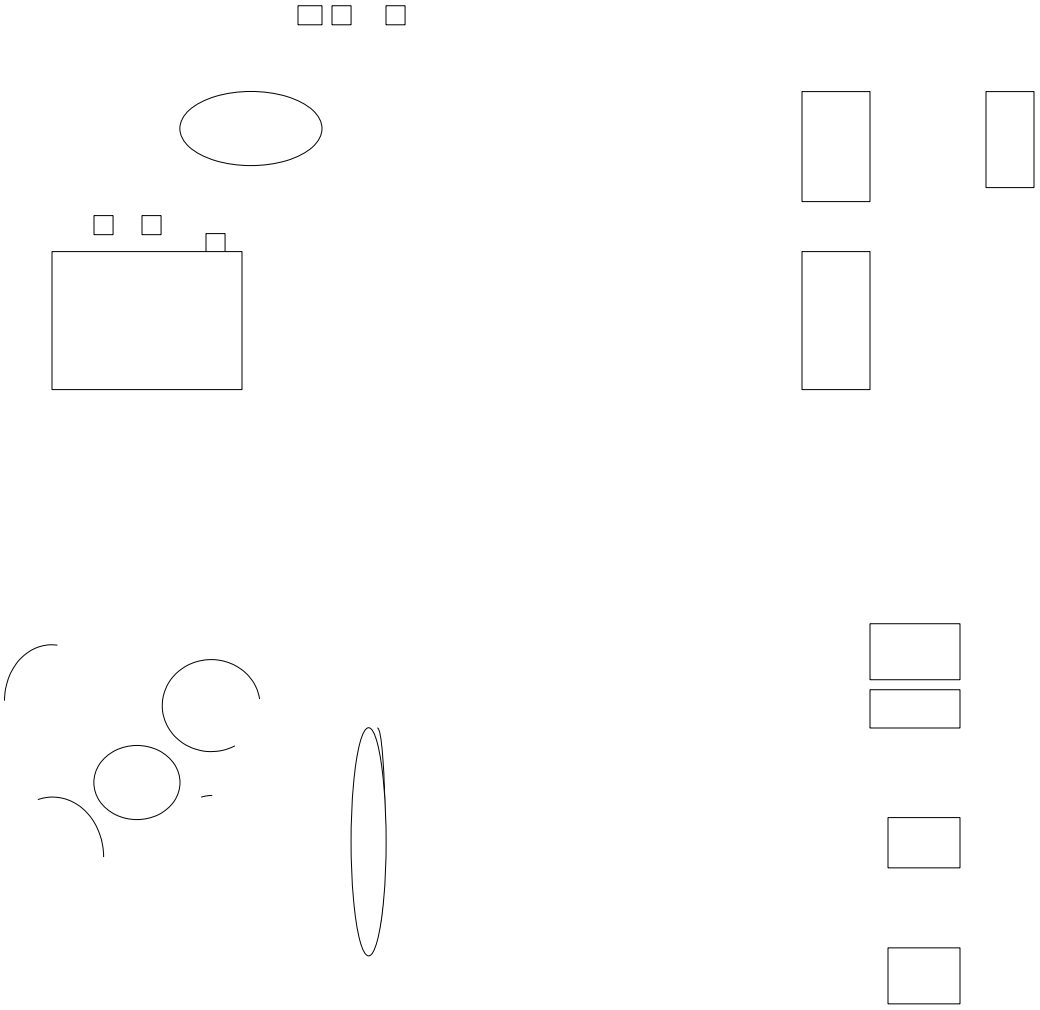

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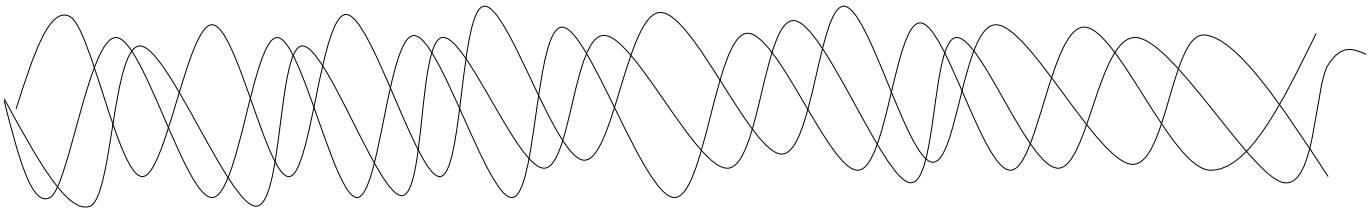

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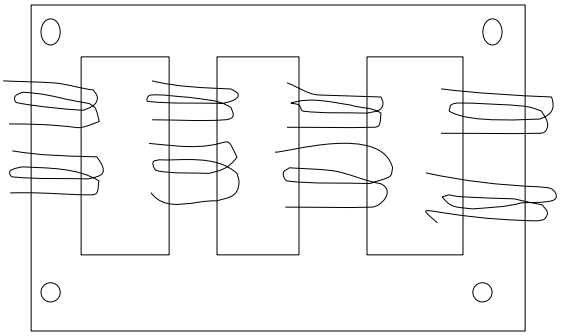

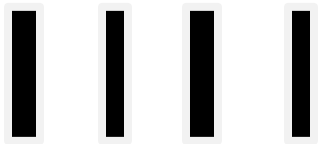

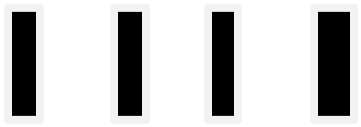

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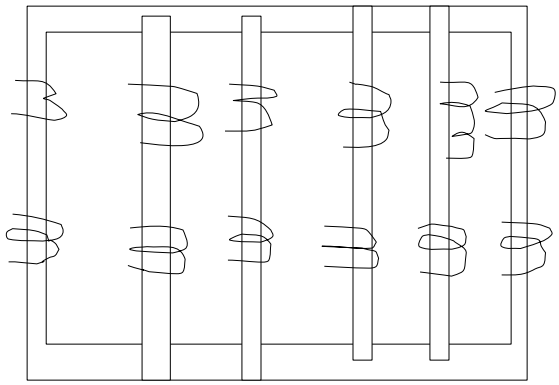

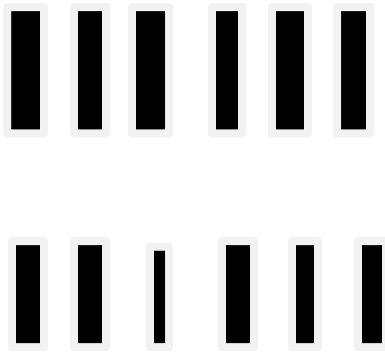

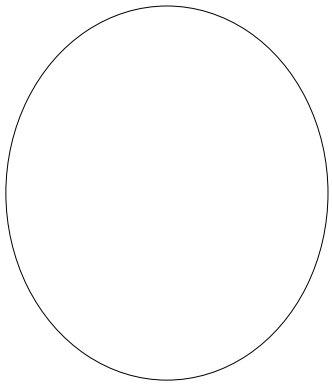

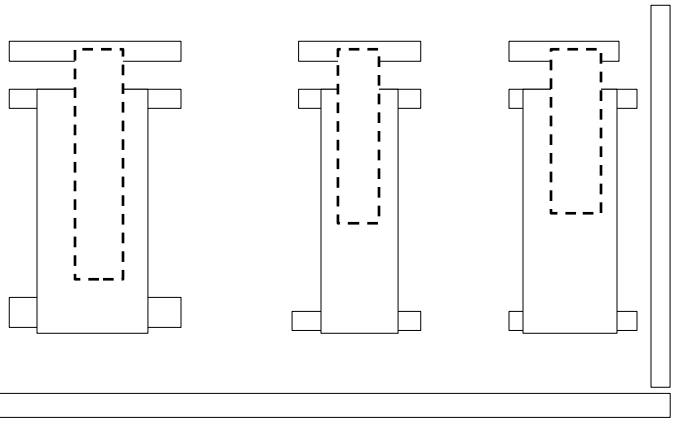

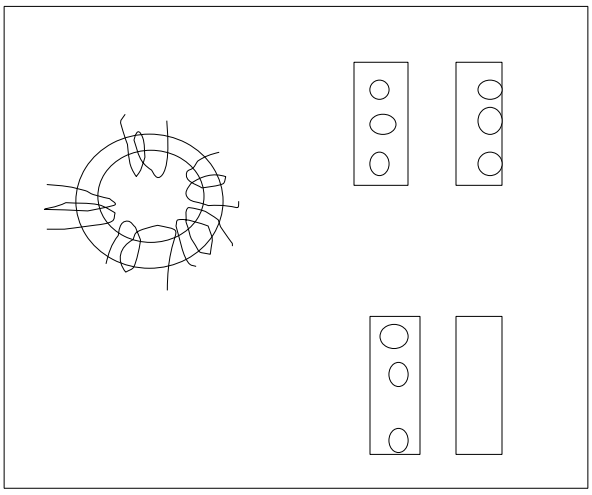

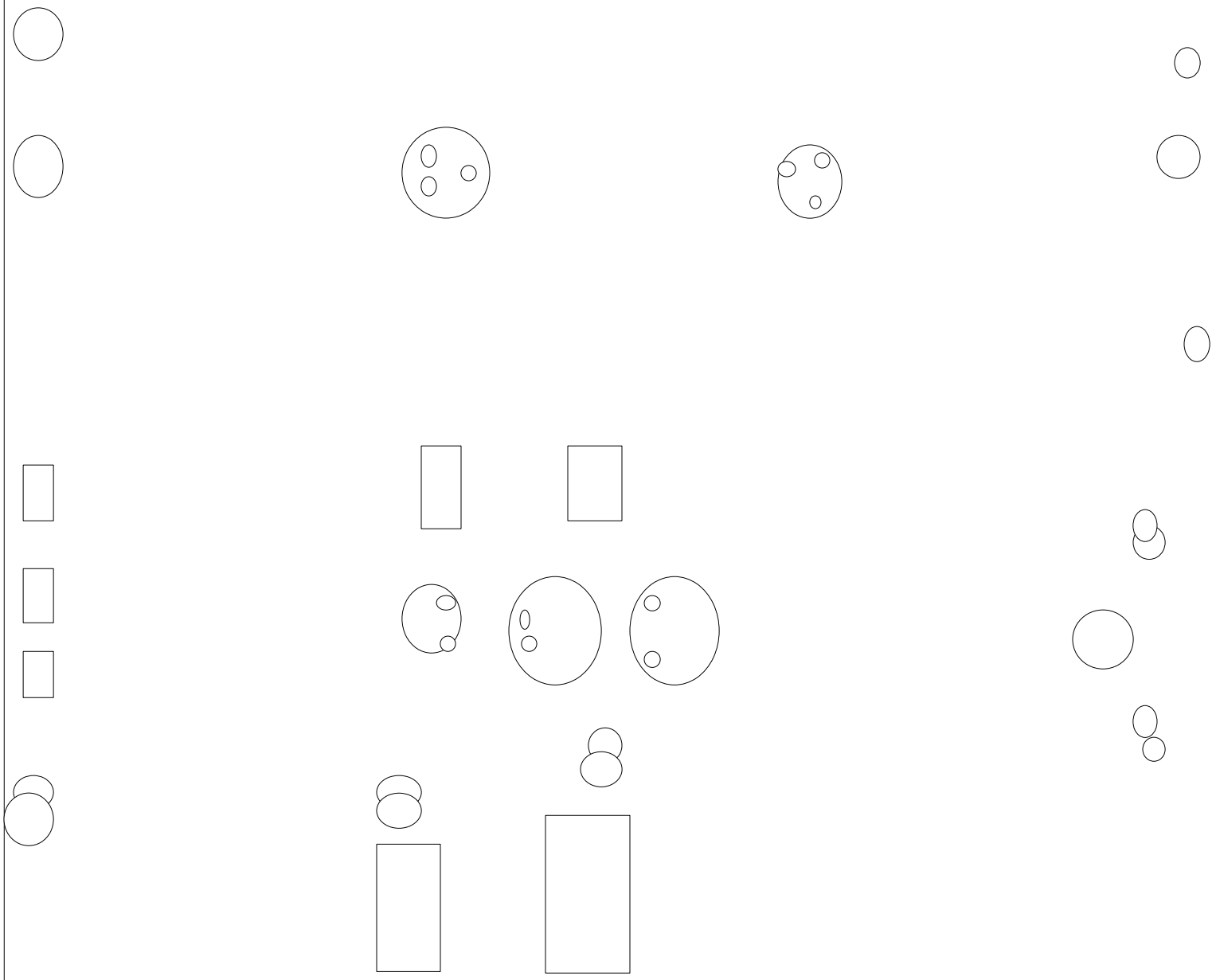

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Masters /engineering

Engineering electrical assessment career but sustainability

About Me

Name

tshingombe tshitadi

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My Education

Engineering electrical diploma

Engineering electrical nqf diploma

Work Experience

Engineering electrical assessment career but sustainability

Engineering electrical databse sarb

Skills

Professional Skills

- 80% Complete

Trade theory electrical panel80%

My Interests & Hobbies

Engineering electrical assessment career but sustainability

Engineering

Some of my work & Certifications

Some Works

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Diploma
This is to certify that
Tshingombe Tshita
SAMPL
Successfully obtained
Maeve Richardson
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OF PARTICIPATION

This certificate is proudly presented to:

Tshingombe Tshita

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Contact

Send me a message

Thank You!

“The definition of insanity is doing the same thing over and over again, but expecting different results.” You want to be different, ”

Videoconferences related to General Interest:
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Videoconferences for the First Phase of your program of study:
Course Communication and Investigation (Comprehensive Resume)
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Course Academic Evaluation (Questionnaire)
Course Experiential Learning (Autobiography)
Course Professional Evaluation (Auto-Evaluation Matrix)

Course Fundamental Principles (Philosophy of Education)
Course Fundament of Knowledge (Integration Chart)
Course Development of Graduate Study (Guarantee of an Academic Degree)

4.1 .12.15,,

Sure! To create a personalized webpage for you, I need some information to help tailor it to your preferences and goals. Here are three questions to get started:

1. **Purpose and Audience: What is the primary purpose of your website? Is it for personal branding, showcasing your portfolio, blogging, a resume, or something else? And wh**o is your target audience?

2. **Content and Features**: What content or sections would you like to include? Common sections might be an "About Me", "Portfolio/Projects", "Blog", "Contact Information", etc. Are there specific features you want, like a contact form or social media integration?

3. **Design and Style**: Do you have any preferences for the design and style of the webpage? Consider aspects like color schemes, fonts, and layout. If you have examples of websites you like, please share those as well.

Feel free to provide as much detail as you like for each question!
  #(Token Used By this Response 251)
The primary purpose of a personal website can vary widely depending on your individual goals. Here are some options to consider:

1. **Personal Branding**: Establishing an online presence that reflects your professional identity and personal interests. Ideal for networking and showcasing your skills.

2. **Portfolio Showcase**: Displaying your work, whether in the form of design, projects, writing, or another medium. This is great for artists, designers, writers, and other creatives.

3. **Blogging**: Sharing your thoughts, ideas, or expertise on various topics. This is perfect if you enjoy writing and want to connect with like-minded individuals or share your knowledge.

4. **Resume/CV**: Presenting your work experience, education, skills, and achievements. Useful for job seekers and professionals looking to increase their visibility.

5. **Other purposes**: There can be other reasons, like creating a community platform, selling products or services, or simply sharing your hobbies and interests.

As for your **target audience**, this could be potential employers, clients, collaborators, or a community of people interested in the same topics you are.

Could you let me know which of these aligns with your vision for the website, or if there’s another purpose you have in mind? Additionally, a brief description of your target audience would be helpful.

Section 5 ..

5.1 topics ..

Student_name :_tshingombe_tshitadi

4.1 .12.15..1 topics :

1 AGI in Human-Machine Collaboration

Exploring how AGI can augment human capabilities and lead to new forms of collaboration.

Future Scenarios of AGI Development

Examining possible future scenarios regarding the development and integration of AGI into everyday life.

4.1 .12.15..1.10nline Retail and E-commerce in the Renewable Energy Sector

This course explores the intersection of online retail and e-commerce with renewable energy. Students will gain expertise in leveraging digital platforms to promote and sell renewable energy solutions, products, and

services. The course covers market trends, customer behavior, e-commerce strategies, and sustainability practices.

1.2 Introduction to E-commerce in the Renewable Energy Sector

An overview of the e-commerce landscape specifically tailored for renewable energy products, services, and solutions.

In 2025, the commerce landscape will be more interwoven with sustainability than ever before. Based on the content extracted from the provided article, here is a Key Takeaways section: any firms are innovating in the ways in which they sell products online. Firms can make use of a range of digital technologies, including artificial intelligence, blockchain, the Internet of Things and autonomous delivery devices like drones or robots to facilitate e-commerce, while new payment services like mobile money and digital wallets widen the scope of e-commerce.

Online platforms match buyers and sellers, including across borders, to facilitate online transactions. Online platforms enable more and different products to be sold, but often require mechanisms that match buyers and sellers, boost trust among unknown e-commerce participants, and encourage more firms to enter the marketplace. Also growing are subscription service business models (e.g. music streaming). Such models enable the continuous provision of products in exchange for recurring payments. Consumers may find such models convenient, particularly for goods that require replenishment, while firms may benefit from lower marginal costs, reduced frictions and longer-term revenue streams. A third business model includes those that use offline or physical features to sell online (e.g. omni-channel models). From automated supermarkets to skip-the-queue mobile application ordering, more firms are experimenting with mechanisms that enable e-commerce while removing the frictions associated with offline ordering.

1.3 Understanding the Renewable Energy Market

Insights into the renewable energy market, including key players, trends, and consumer

Targeted, flexible and co-ordinated policies can unlock the potential of e-commerce

The rise of the Internet in the 1990s fuelled the growth of e-commerce and put it on the agenda of policy makers worldwide. But the rapid pace at which digital transformation has progressed and the dynamism of e-commerce markets requires a fresh look at policy frameworks to ensure

that they support further e-commerce innovations. In particular, three policy considerations should be taken into account.

1.4. E-commerce Strategies for Renewable Energy Products

Effective e-commerce strategies tailored for marketing and selling renewable energy products online.

E-commerce must be better measured and e-commerce policy more co-ordinated to unlock the potential of e-commerce for all

Technological change is altering the e-commerce landscape, and these new developments affect policy frameworks along several dimensions. Some of the challenges identified in the early days of e-commerce remain relevant (e.g. related to data protection), but new challenges have also emerged (e.g. the rise of tradeable services and their implications for trade policy). These developments require a holistic approach to e-commerce policy making, including co-operation and collaboration across policy areas. In particular, consumer protection, taxation, competition, trade and environmental policies should be co-ordinated, including at the highest levels of government and at the global level, to ensure that trade-offs are carefully considered and to guard against unintended consequences of misaligned policy action. Many such rules are local, which further underscores the need for a consistent and co-ordinated whole-of-government approach to e-commerce policy making at all levels of government.

At the same time, a lack of e-commerce data limits the ability of policy makers to determine the need for policy action and calls for more focus on the e-commerce measurement agenda. On the one hand, the harmonisation of available data on e-commerce across countries (e.g. ICT usage surveys) should continue and adjust in response to an evolving technological environment. Changing technologies and business models might eventually also warrant a reconsideration of the current OECD e-commerce definition. At the same time, the limitations of ICT usage surveys requires governments to foster the inclusion of e-commerce related questions in other official data sources, such as structural business or household expenditure surveys, as well as the use of non-standard data sources.

Targeted policies can address e-commerce divides

Those who do not or cannot engage in e-commerce may find themselves on the wrong side of a potentially persistent and harmful digital divide as digital transformation progresses. SMEs lag behind larger firms in terms of e-commerce participation, but policy can help by addressing bottlenecks that might result in high costs associated with delivery and returns. Reducing regulatory uncertainty and fostering an inclusive business

environment can help small firms trade online and across borders, as well as integrate successfully with larger service providers, such as online platforms.

E-commerce gaps for individuals remain significant along a range of dimensions, including education, income, age and gender, as well as for those living in rural areas. Factors that reduce participation of these groups are often related to economic and social conditions that reach far beyond e-commerce, including rural-urban divides, income distribution, unequal access to education and an aging society. With regard to e-commerce, these conditions may manifest themselves in low connectivity, a lack of digital skills, low levels of trust or a lack of viable payment options, all factors that can be addressed by policy action

1.4 Consumer Behavior in Online Retail

Analyzing consumer behavior and preferences in the context of online retail for renewable energy products.

3.1 Electric power B2B descriptions

The Business-to-Business (B2B) framework within the electric power industry stands as a unique and complex entity, markedly different from the more familiar terrain of consumer focused markets. This distinction is not merely in scale but also in the depth and intricacies of its operations. Predominantly characterized by transactions of substantial magnitude, the electric power B2B sector encompasses a vast array of activities. These range from the procurement of heavy duty equipment in bulk quantities to the formulation and execution of comprehensive contracts that oversee power generation, transmission, and distribution across vast geographical expanses.

The sheer scale and complexity of these transactions give rise to extended sales cycles. Unlike the swift decision-making often seen in B2C scenarios, B2B dealings in the electric power industry are methodical and deliberate. Each transaction, be it a purchase order for machinery or a long-term service contract, undergoes a meticulous process of evaluations. These assessments are not just about cost-effectiveness but also delve into the technical compatibility, long-term viability, and potential scalability of the offerings. Negotiations, often spanning multiple rounds, aim to strike a balance between commercial interests and operational feasibility. Furthermore, the approval processes are multi-tiered, involving various stakeholders from technical experts and financial analysts to top-tier management, ensuring that every decision aligns with the organization's strategic objectives.

In this industry, the products and services on offer are not generic; they are highly specialized solutions crafted to address specific challenges. Whether it's a state-of-the-art transformer, an advanced grid management system, or consultancy services for renewable energy integration, each product or service demands a deep-seated understanding. Stakeholders must grasp not only the technical specifications but also the broader implications of their choices. This includes potential integration challenges with existing systems, adherence to ever-evolving regulatory frameworks, and ensuring compliance with both local and international safety and environmental standards. In essence, every B2B transaction in the electric power sector is a testament to the industry's multifaceted nature, where commercial, technical, and regulatory considerations converge.

3.2 Notations

In this section, we introduce and define the notations that will be used throughout the methodology. This notation serves as the foundation for understanding the data structures, user behaviors, and item attributes, as well as the collaborative filtering approach we use to recommend products to users.

U: Represents the set of all users in the system. Each user is uniquely identified by an index in this set, N represents the number of the users.

I: Denotes the set of all items available in the system. Similar to users, each item is uniquely identified by an index in this set, M represents the total number of the items.

n: Represents the number of categories for individual product attributes.

m: Represents the number of categories for user behaviors.

$S(u, v)$*:* Represents the similarity between users u and v. This similarity metric is crucial for collaborative filtering, as it determines how similar two users are in terms of their preferences. The basic formula for collaborative filtering is given by Equation 1:

$$rui=\sum v\in US(u,v)rvi \quad (1)$$

O_{ui}, A_{ui}, B_{ui}: these notations denote the order, following, and browsing numbers respectively for user u and item i. They capture different types of implicit feedback from users.

w_o, w_a, w_b: these are the weight ratios associated with order, following, and browsing data respectively. They determine the significance or influence of

each type of implicit feedback in the recommendation process. For examples, we can set $w_o = 1$, $w_a = 0.5$, $w_b = 0.5$.

BI_u, NBI_u: these vectors are behavior numbers varying time, representing the bidding and non-bidding behaviors of user u respectively. They capture unique B2B behaviors that are essential for understanding user preferences in the electric power E-commerce domain.

The foundation of this collaborative filtering approach is based on the principle that users who have behaved similarly in the past will continue to have similar preferences in the future. The notations introduced above will be instrumental in formulating and understanding the mathematical models and algorithms we employ in subsequent sections.

1.5 Digital Marketing for Renewable Energy E-commerce

Best practices for digital marketing in promoting renewable energy products and services online Public policies can support the creation of innovative e-commerce business models

As digital transformation progresses, new business models will arise in ways that are difficult to predict, but which also challenge traditional policy frameworks. In particular, some regulatory barriers preserve artificial distinctions between online and offline commerce, even as firms increasingly pursue business models that combine both elements. Where local zoning laws prevent multi-purpose use of brick-and-mortar stores, or planning regulations prevent the development of new last-mile logistic solutions, the potential of e-commerce diminishes.

Regulatory approaches to new e-commerce business models should focus on remaining experimental, transparent and flexible. Experimental regulatory waivers have been successfully used to test new technologies like drones and digital payment mechanisms; future applications for e-commerce could include cryptocurrencies and 3D printing. Existing rules could be made clearer to reduce uncertainty for innovative firms. Policy makers should avoid attempting to regulate particular business models. Instead, they should ensure that particular business functions conform with regulatory frameworks, while better accounting for the interlinkages across business functions.

1.6. Sustainable Practices in E-commerce

driven solutions are revolutionizing retail operations by optimizing supply chain management and e-commerce processes. Ant colony optimization (ACO) algorithms play a crucial role in improving vehicle routing, enhancing

delivery speed, reducing costs, and minimizing resource use (Revanna & Al-Nakash, 2023; Ushada et al., 2022). In e-commerce, AI scrutinizes user behavior to track browsing patterns, cart additions, and purchase completions. Neural networks like WaveNet refine sales forecasting by analyzing product descriptions, enabling businesses to predict demand and better manage inventory and marketing (Chen et al., 2024). Moreover, deep learning models process clinical and genetic data for improved medical diagnostics, such as early cancer detection (Kumar et al., 2023). Together, these AI technologies create an efficient, adaptive business ecosystem.

Theme 4: AI-Enhanced Shopping Experience

AI is transforming e-commerce by boosting operational efficiency and customer engagement through personalized shopping experiences (Birau et al., 2023; Subbaiah et al., 2024). Machine learning enhances this by accurately predicting customer churn, enabling effective retention strategies (Lee et al., 2024). AI also automates inventory management, reduces costs, and enhances data security (Birau et al., 2023). AI-driven chatbots improve customer service and facilitate cross-border transactions (Meltzer, 2023). By analyzing social media feedback, AI provides actionable insights that help businesses refine strategies and products (Alotaibi, 2023). These tools reshape consumer behavior, making shopping more personalized and increasing retention and sales for e-commerce.

Implementing sustainable business practices within the e-commerce model for renewable energy.

1.7 Case Studies in Renewable Energy E-commerce:

3.3 Fusion of behavioral data

The fusion of behavioral data is a pivotal step in the methodology, aiming to create a comprehensive representation of user interactions on the platform. This section delves into the intricacies of how different types of behavioral data are combined to provide a holistic view of user preferences and activities.

3.3.1 Order, following, and browsing data

These three types of data capture the most direct interactions of users with items on the platform. Order data (O_{ui}) represents confirmed transactions,

following data (A_{ui}) signifies items that users have shown interest in, and browsing data (B_{ui}) captures the items that users have viewed or explored.

3.3.2 Weight ratios

The weight ratios w_o, w_a, $andw_b$ are crucial in determining the significance of each type of interaction. They allow us to assign varying importance to different behaviors, reflecting the relative impact of each interaction type on user preferences. For instance, a confirmed order might carry more weight than merely browsing an item.

3.3.3 Bidding and non-bidding data

Unique to the B2B E-commerce landscape, bidding (BI_u) and non-bidding (NBI_u) data provide insights into the negotiation and decision-making processes of users. These behaviors, while not directly linked to transactions, offer valuable context about user intentions and preferences.

3.3.4 Behavior vectors

The behavior vectors for bidding and non-bidding data are formulated to capture the essence of these unique interactions. By characterizing user similarity through these vectors, we can better understand the relationships and similarities between users based on their bidding and non-bidding behaviors.

The fusion formula for order, following, and browsing data is given by Equation 2:

$$Fui = woOui + waAui + wbBui \quad (2)$$

This formula ensures that each type of interaction contributes proportionally to the final fused representation based on its assigned weight. A cosine similarity measure is used here to characterize user similarity for the fusion of behaviors, as detailed in Equation 3.

$$Sf(u,v)=\cos(\theta)=Fu\cdot Fv||Fu||||Fv|| \quad (3)$$

For bidding and non-bidding data, we employ a cosine similarity measure to characterize user similarity $S_{bid}(u, v)$, $S_{nb}(u, v)$. This metric captures the angle between the behavior vectors, providing a measure of how alike two users are in terms of their bidding and non-bidding behaviors:

The fusion of behavioral data is a multi-faceted process that combines various types of user interactions to create a unified representation. This

representation serves as the foundation for subsequent recommendation processes, ensuring that all relevant user behaviors are considered.

3.4 Fusion of item attribute information

The integration of item attribute information is a cornerstone in the methodology, ensuring that the attributes and characteristics of items are adequately represented and factored into the recommendation process. This section elucidates the methods and rationale behind the fusion of various item related data, highlighting the importance of capturing the multifaceted nature of products in the B2B E-commerce domain.

3.4.1 Item attribute vector

Central to the approach is the concept of item attributes. This vector encapsulates various attributes of an item, such as its category, suppliers and other relevant metadata. For each item and each item attribute (e.g. category), we construct a one-hot-vector based on different values of attributes. Hence, the size of item attribute vector IA related to individual item attribute is $M \times n$.

3.4.2 User behavior matrix

With the item attribute vectors in place, we can then construct the user-attribute behavior matrix. Firstly, the overall user behavior vector $B_{m\times M}$ is established with each element representing the number of specific behavior (e.g., order number) for each item. The m is the number of behavior types and M is the number of items. Secondly, through matrix operations $B_{m\times M}IA_{M\times n}$, we can obtain the user specific-attribute interaction matrix $R_{m\times n}$. Finally, by summing up each column of the matrix, we can obtain a vector representing the behavioral performance of each user for each attribute. Therefore, the user-attribute behavior matrix $M_{N\times n}$ is established. Mapping user behaviors onto the item attribute vectors, we can capture the nuanced interactions between users and the multifaceted attributes of items.

3.4.3 Similarity computation

The fusion of item attribute information and user behavior culminates in the computation of similarity scores. The item-attribute similarity $S_{item}(u, v)$ extracted from $M_{N\times n}$, measure the likeness between two users based on their item attribute information (e.g. item category, suppliers) and the aggregated user interactions (e.g., order, following, browsing). The similarity scores play a pivotal role in the recommendation process, guiding the system toward items that are contextually and attribute wise similar to the user's preferences.

To compute the similarity between users based on their item attribute vectors and user interactions, we employ the cosine similarity metric. In this paper, $S_{item}(u, v)$ is composed of four parts, mainly the three category (primary, secondary and tertiary item category) similarities $S_{itemcategory}(u, v)$ and one supplier similarity $S_{itemsupplier}(u, v)$.

In essence, the fusion of item information is a meticulous process that aims to bridge the gap between raw item attributes and structured data representations. By integrating item characteristics with user behaviors, we ensure that the recommendation system is both context-aware and attribute-sensitive, leading to more accurate and meaningful recommendations.

3.5 Fusion of behavioral data and item information

The recommendation method forms the crux of the approach, leveraging the fused behavioral data and item information to generate personalized product suggestions for users. This section delves into the intricacies of the recommendation algorithm, elucidating the steps and logic that drive the generation of tailored recommendations.

3.5.1 User similarity computation

At the heart of the recommendation method is the computation of user similarity. By comparing the behavior profiles of different users, we can identify patterns and preferences that are shared among them. This similarity metric, denoted as $S(u, v)$, provides a measure of how alike two users are in terms of their interactions and preferences. It serves as a foundation for identifying potential items that might be of interest to a given user, as detailed in Equation 4.

$$S(u,v)=Sf(u,v)+Sbid(u,v)+Snb(u,v)+Sitem(u,v) \quad (4)$$

The elements in similarity matrix $S(u, v)$ vary between 0 and 7. The higher the value in the matrix, the greater the similarity between the related users.

3.5.2 Historical data consideration

A user's historical data plays a pivotal role in shaping recommendations. By analyzing past interactions, purchases, and preferences, we can glean insights into a user's tastes and inclinations. This historical context ensures that the recommendations are not only based on current interactions but also influenced by a user's long-term behavior.

3.5.3 Item ranking

Once user similarities are computed and historical data is factored in, the next step is to rank items based on their relevance to a given user. This ranking process involves scoring items based on their potential appeal to the user, considering both the user's behavior and the item's attributes.

3.5.4 Top-K recommendations

The culmination of this recommendation method is the generation of the Top-K recommendations. These are the K items that have the highest relevance scores for a user. By focusing on the top-rated items, we ensure that users are presented with products that are most likely to align with their preferences and needs.

The recommendation for a user u is formulated as Equation 5:

$$RSu=\{i1, i2, \ldots, iK\} \quad (5)$$

where $i_k \in I$, and K is defined as the mean of historical order number of user u. This formula ensures that the recommended items are those with the highest relevance scores, taking into account both user similarity and item attributes.

In summary, this recommendation method is a multi-faceted approach that synergizes user behaviors, item attributes, and historical data to generate personalized product suggestions. By considering a wide array of factors and employing sophisticated algorithms, we aim to provide users with recommendations that are both relevant and meaningful, enhancing their e-commerce experience.

Examination of successful case studies in renewable energy e-commerce businesses.

1.8 Regulatory Environment for Online Retail in Renewable Energy:

Experiments and discussion

In this section, a real case dataset was utilized to assess the effectiveness of the proposed recommendation model. The case study results demonstrate the proficient performance of the proposed approach.

4.1 Data descriptions

The research presented in this study heavily relies on the rich dataset sourced from Beijing Huadian E-commerce Technology Limited Company, a

leading entity in the B2B E-commerce sector of the electric power industry. This meticulously curated dataset, which spans the entire duration of 2022, offers an unparalleled window into the multifaceted interactions of 217 distinct users as they navigate through an extensive catalog of 346,672 products.

At the heart of this dataset lies five pivotal categories of user behavior: order data, following data, browsing data, bidding data, and non-bidding data. Each of these categories, while valuable in its own right, collectively paints a comprehensive picture of user interactions, preferences, and decision-making processes on the platform. The more traditional data types, such as order, following, and browsing data, provide insights into patterns of product discovery, interest, and acquisition. On the other hand, the inclusion of specialized data types like bidding and non-bidding data offers a deep dive into the unique B2B behaviors that set this platform apart from conventional e-commerce platforms. The intricate relationship between bidding activities and order behaviors, for instance, sheds light on the multi-layered negotiation, evaluation, and decision-making phases that often precede a finalized B2B transactio

Understanding the regulatory and compliance landscape impacting e-commerce in renewable energy.

1.9 Future Trends in Online Retail and Renewable Energy

Exploring future trends and innovations at the intersection of online retail and renewable

heme 5: AI-Powered Product Recommendations

AI technologies like collaborative filtering (CF) and recommender systems are transforming e-commerce by providing personalized product suggestions. Integrated into e-commerce platforms, recommender systems help users navigate vast inventories with tailored recommendations based on their preferences and behavior (Jha et al., 2021). By analyzing user data, these systems improve both user experience and engagement, optimizing recommendation personalization (Zhao, 2023). CF is particularly effective, using insights from multiple users to predict individual preferences based on shared product interactions (Yu et al., 2021). These AI-driven tools give businesses a competitive edge by enhancing user engagement.

Theme 6: Advanced E-commerce Analytics

In the dynamic world of e-commerce, a suite of innovative technologies including big data analytics, data mining, and deep learning is revolutionizing online trading and enhancing customer experiences. At the forefront, big data analytics and data mining are critical for managing large datasets, which help in predicting customer preferences and bolstering decision-making processes (Jeevitha et al., 2023; Mandala et al., 2023). Specifically, data mining technology plays a key role in efficiently extracting vital information from e-commerce platforms, facilitating text retrieval, and analyzing consumption trends to forecast consumer demand and purchasing power (Zhong, 2022). Moreover, deep learning models like “DeepLimeSeg” are enhancing these capabilities further by refining customer segmentation through advanced algorithms, thereby improving the precision and transparency of marketing efforts (Talaat et al., 2023). Collectively, these advanced tools are reshaping e- commerce, facilitating more personalized and efficient interactions that enhance the customer experience.

Theme 7: Customer Support Powered by AI

This theme discusses the strategic utilization of AI-powered chatbots by e-commerce enterprises to elevate customer satisfaction levels, optimize operational processes, and establish a distinctive presence in a fiercely competitive market landscape. Chatbots, functioning as virtual assistants, employ AI and NLP algorithms to engage users, replicate human interactions, and provide efficient responses to inquiries in various industries (Siddig & Hines, 2019). They enhance personalized support, reduce customer service costs through automation, and play a vital role in resolving complaints promptly, leading to increased customer satisfaction (Khan, 2020; Singh et al., 2024). Furthermore, these AI-powered assistants contribute to rebuilding customer trust post-service issues and implementing strategic service recovery measures (Song et al., 2023). In essence, chatbots represent a valuable asset in elevating customer experiences and streamlining service operations in the modern digital era.

These themes collectively demonstrate the transformative impact of AI technologies on various aspects of e-commerce, from personalized recommendations and predictive analytics to enhanced customer service and supply chain optimization. By embracing AI-driven strategies and solutions, e-commerce businesses can stay competitive, drive growth, and deliver superior shopping experiences to customers in today’s digital marketplace.

Future Research Frontiers in AI for the E-commerce Sector

The application of the theory, context, characteristics, and methodology (TCCM) framework is essential for comprehensively exploring the multifaceted impact of AI in e-commerce, especially as this field continuously evolves with new technologies and consumer demands. By structuring the study around the TCCM elements, this approach allows for an organized analysis of AI's role in transforming online commerce, enhancing both academic insight and practical implications for industry stakeholders (Paul et al., 2023). The field of AI and e-commerce is evolving rapidly, offering innovative ways to enhance consumer experience, personalize interactions, and drive business growth. However, this rapid growth also brings challenges that require critical examination, particularly concerning consumer trust, ethical considerations, and sustainable engagement. This objective (RQ5) seeks to explore future research prospects in AI-driven e-commerce through the TCCM framework, which provides a comprehensive structure

4.1 .12.15..2.topics :

4.1 .12.15..2.1Publishing and Natural Resources Management:

This Masters-level course is designed to explore the intersection of publishing and the management of sustainable natural resources. It focuses on how publishing can be an effective tool in promoting sustainable natural resources management, raising awareness, and influencing policy and public perception. Students will engage in both theoretical and practical approaches to sustainable communication and publishing strategies, understanding the role of different media in shaping narratives around sustainability and natural resources conservation

4.1 .12.15.2.2 Introduction to Sustainable Natural Resources Management:

This topic covers the fundamental principles of sustainable natural resource management and its importance for future generations.
Challenges in natural resource management for ecological sustainability

Saikat Mondal, Debnath Palit, in Natural Resources Conservation and Advances for Sustainability, 2022

2.3.1 Resource planning strategy and ownership regime

NRM strategies can be classified by the form and interest of the stakeholders:

(a)

State property regime

Power and control of resource usage have been in the possession of the State. Any person can also use the resources, but only with the state's consent. Some examples are the national forest, national parks and military reserves.

(b)

Private property regime

Any properties owned by an established corporate or individual organization. The owner(s) are responsible for both the advantage and the responsibilities to the resources. The most prominent example is private property.

(c)

Common property regimes

It's a group's private ownership. The scale, complexity and structure of the group can differ, e.g., aboriginal community, village neighbor. Public parks, grasslands and water resources are few examples.

(d)

Nonproperty regimes

Such assets do not have a definitive owner. Each prospective consumer has the sam

Natural Resource Management (NRM) refers to the sustainable utilization of major natural resources, such as land, water, air, minerals, forests, fisheries, and wild flora and fauna. Together, these resources provide the ecosystem services that provide better quality to human life. Natural resources provide fundamental life support, in the form of both consumptive and public-good services. Ecological processes maintain soil productivity, nutrient recycling, the cleansing of air and water, and climatic cycles.

Biological diversity (biodiversity) is the occurrence of different types of ecosystems, different species of organisms with the whole range of their variants and genes adapted to different climates, and environments along with their interactions and processes. Biodiversity encompasses the variety of all life on earth. India is one of the 17 mega-biodiversity countries of the world. Although India has only 2.5% of land area, it has a large pool and diverse pool of plants and microbes which accounts for 7.8% of recorded species in the world. Genetic diversity describes the variation in the number and type of genes as well as chromosomes present in different species. The magnitude of variation in genes of a species increases with increase in size and environmental parameters o

2.3 The Role of Publishing in Sustainability:

Explore how different publishing platforms can be used to promote sustainability and educate the public on environmental issues. ong-term sustainability must be a primary goal for any academic publisher. Without it,

knowledge published in journals, books and other formats risks being damaged or lost. If

one step in a series of research disappears, it casts doubt on subsequent work. Publishers,

as disseminators of verified research, have a responsibility to ensure that published

works remain available for future generations.

2 The aim of this paper is to present the point of view of a commercial open access

publisher with regards to sustainability in the current publishing landscape. We briefly

outline salient points from the history and current state of electronic publishing. The

emphasis is on sustainability, and covers both the development of open access and the

story of MDPI. We then move on to some current projects arising from our focus on

sustainability. Putting sustainability at the heart of publishing activities is an imperative

and in the age of electronic publishing new options are emerging that this goal make it

easier to achieve. There are concrete steps that can be taken by any academic publisher

to ensure the sustainability, preservation, and effective dissemination of knowledge.

3 MDPI sees two primary aspects to sustainability. The first pertains to the preservation of

knowledge. Knowledge creation without sustainability makes little sense. New discoveries

builds on older research, which must be archived and preserved, or what comes after it

does not have a firm foundation. The second strand is MDPI’s view that open propagation

of knowledge will enhance mankind’s future and preserve our environment. The founder

of MDPI, Shu Kun Lin, built the company in the belief that advances in research are a key

contributor to solving many of the most pressing needs of our age, including over-use of

the world’s resources and the threat of climate change. The implementatio

2.4 Environmental Journalism and Communication

Learn the techniques and ethics of reporting on environmental issues, and how this impacts public awareness and policy-making.

2.5 Digital Publishing and New Media

Analyze the role of digital publishing and social media in shaping discussions and actions regarding sustainability.

2.6 Content Creation for Natural Resource Management

Discover practices for creating engaging content that effectively communicates the importance of sustainable natural resource management.

2.7 Policy Advocacy and Public Engagement: xploration. The platform further provides a weekly summary of SDG topics and progress that allow researchers to quickly scan through a collection of papers and determine their relevance. Cactus Communications is developing this technology further to support researchers, institutions, publishers and policymakers in recognizing SDG-relevant research.

Springer Nature has also released 17 SDG Content Hubs with the goal of connecting researchers addressing SDG challenges with policymakers and business practitioners. By enhancing the visibility of SDG publishing activities through the content hubs, they aim to connect the key communities needed to drive global progress.

The RELX SDG Resource Center is another example that aims to aid researchers and the public by giving them access to critical content that builds understanding about the SDGs. The resource center hosts multiple initiatives like annual events, podcasts, in-depth reports, SDG News Tracker (by LexisNexis Newsdesk) and key research published by Elsevier, all under one roof.

2.2. New journals on SDG-relevant topics

In recent years, many academic publishers have increasingly focused on issues related to sustainable development, aligning with global priorities of the SDGs. For example, PLOS has expanded their Open Access portfolio to include more focused journals like PLOS Climate and PLOS Global Public Health, which directly address environmental sustainability and global health challenges. Similarly, Springer Nature has launched several specialized journals such as Nature Food, Nature Sustainability, Nature Energy, and Nature Water. These journals aim to foster interdisciplinary research that drives innovation in food security, sustainable resource management, renewable energy, and water conservation, critical areas underpinning the SDGs.

Furthermore, the trend towards open access publishing has been instrumental in democratizing knowledge and fostering inclusivity in scientific discourse. Springer Nature's Discover series, including Discover Cities, Discover Oceans, Discover Energy, and Discover Sustainability, exemplifies this shift by offering a fully open access (OA) platform for researchers across the globe. By publishing Open Access, these journals are dedicated to reaching a broader audience of policymakers, global scholars, and the public. Additionally, platforms like ScienceOpen have introduced journals such as the Journal of Disability Research published by the King Salman Center for Disability Research, which contributes to SDG goals like reducing inequalities. ScienceOpen also provides publishing solutions for local journals like the Nigerian Journal of Tropical Engineering or the Journal of Ecological Society from Pune, India. These initiatives reflect a growin

Learn about the strategies for using publishing to advocate for policies supporting sustainable natural resources management.

2.8 Sustainable Practices in Publishing:

he paradoxical nature of the open access movement has been widely acknowledged. What started as a movement that was to make research open and accessible to all, ensuring equitable participation, might have just contributed to creating more inequalities. The open access publishing models, largely still relying on Article Processing Charges (APCs), have indeed opened access to readers, at the same time closing it for authors unable to pay the ever-rising fees [2]. Several publishers took active steps

towards reviewing their business models to create approaches that would deliver on the Open Science promise [3].
At PLOS, we experiment with business models that aim to forge a truly inclusive publishing environment and remove financial barriers to authors and institutions. We do so by listening to the communities and developing models that address specific needs. And we do it through trial and error: launching pilot models like Community Action Publishing (CAP). With it, we tackled the question of selective journals. Selectivity does not have to mean that costs become huge, and it does not need to perpetuate exclusion. To show that selectivity is possible without high APCs and to move beyond a model that is built on 'articles'. This model aims to eliminate author APCs to make our most selective Open Access journals truly open to read

Explore how publishing companies are adopting sustainable practices to minimize their environmental impact.

2.9. Case Studies in Effective Sustainability Communication:

group recognizes the challenges faced by all stakeholders – researchers, funders, institutions, and publishers – in navigating the current OA landscape. They aim to address the perverse incentives and administrative burdens associated with APCs and explore sustainable, inclusive alternatives. The goal is to move towards an equitable OA model that supports diverse research outputs and fosters Open Science practices. This initiative aligns with broader efforts to make OA more inclusive and equitable, reducing reliance on APCs and transformative agreements that benefit only a few large publishers.

The group, which includes librarians, funders, and publishers, aims to develop models that do not rely on APCs, recognizing their unfairness and limitations. Initial discussions revealed that merely identifying equitable models is insufficient, leading to the development of a framework to assess the equity of various business models. Inspired by SPARC's "How Open is it?", this "How equitable is it?" framework will use a set of questions to evaluate and benchmark business models based on equity criteria. This approach allows institutions, publishers, and funders to assess and promote equitable participation in research. The framework focuses on criteria such as eliminating financial barriers, ensuring fee transparency, and promoting open research practices. This model-agnostic framework empowers stakeholders to determine the equity of different OA arrangements

effectively. The framework, as of June 2024 in its first draft form, after review, shall be released to the community later this year.

3.3. Equity recommended

The Open Access Scholarly Publishing Association (OASPA) presents yet another take on addressing the issue of equity. As they strive to hear all the voices of stakeholders from diverse geographical and economic contexts, they devoted 2023 to workshops and feedback sessions dedicated specifically to the notion of equity in open access publishing. OASPA defines equity in OA as addressing both financial barriers to publishing and ensuring inclusive engagement models, advocating for the removal of author-facing fees to make OA accessible to all researchers. Their research highlighted that publication charges hinder many authors globally, suggesting that current pay-to-publish models only benefit a minority. OASPA aims to shift towards OA by default, where all content is freely accessible without author fees, though acknowledging this requires sustainable financial models. Based on their research they have now formulated a set of recommendations to increase equity in open access. OASPA is currently asking for the community's feedback on the first draft of this document.

Regardless of what concrete steps the scholarly communications community chooses to take to address the question of equity, it is vital to realize that this is not a one-person job. The success of the SDG blueprint relies on collaborative, cumulative commitment coming from all stakeholders in the scholarly communications sector: researchers, publishers, funders, librarians, policymakers and more. On a global scale, beyond our small academic publishing circle, it relies on global cumulative action, with all on board.

4. Translating research into practice

Charlie Rapple, Co-founder, Kudos (growkudos.com)

Part of the challenge of achieving the SDGs is that they require grassroots change. Sustainability can be encouraged via top-down government interventions, but only mass attitudinal and behavioural change will 'move the needle' for a lot of the goals. This means more people need to be aware of the goals, and to be persuaded to take action. This is something that we in the scholarly community are well placed to support. We have an

important role to play in filling the knowledge gap, helping people around the world to understand the evidence that has shaped the goals, and the research that underpins recommended actions. This breaks down into three areas: cognitive accessibility, discoverability, and user experience.

4.1. Cognitive accessibility

Traditional scholarly communications, such as research articles, monographs, even textbooks, are not designed for influencing broad audiences. But they do provide the basis for telling persuasive stories around research: adding context (real-world examples of challenges being faced by communities or environments) and fleshing out the potential impact (how things could improve if the research was put into practice). Some examples include:

•

Adding plain language summaries to research publications - explaining what the research is about and why it is important helps more people understand it; plain language summaries are also much more easily translated for speakers of other languages.

•

Communicating research visually - many of those who are affected by the SDGs, or who need to act differently if the SDGs are to be achieved, do not have high levels of literacy. Infographics, videos, and other multimedia interpretations of research findings can help maximize the audience for research.

•

Audience briefings - providing recommendations for different groups, such as policymakers, healthcare practitioners, educators and industry can help expedite change by more clearly setting out wh

Analyze real-world examples where effective communication and publishing have contributed to successful sustainable resource management.

3 topics :

4.1 .12.15..3.1 Masters in Supply Chain Management and Traceability

This course is designed for students pursuing a Master's degree, focusing on the integration of software engineering principles with supply chain management and traceability. The course explores how modern software solutions can enhance supply chain efficiency and transparency, leveraging advanced technologies to ensure the seamless traceability of goods from origin to consumer. Students will gain an in-depth understanding of the design and implementation of traceability systems within complex supply chains.

3.2 Introduction to Supply Chain Management

An overview of the basic concepts and components of supply chain management, focusing on the flow of goods, information, and finances.

he way in which companies have conducted, managed, controlled and integrated their

business operations have experienced dramatic changes during the last couple of years –

this is especially true in the worldwide recording and music industries. Rapid advances

in technology and increasing regulatory freedom have changed the rules of operation

and competition. Businesses are now competing globally and traditional barriers

between industries are breaking down. To cope with these and other changes and

achieve superior performance, business leaders are moving towards new business

paradigms that allow their companies to work more closely together with their

traditional and new business partners (which include all clients and suppliers up and

down the supply chain), in order to adapt to the rapidly changing marketplace.

As discussed in the fourth chapter under point 4.2, it is proposed by the mentioned

authors that this new collaboration can be successfully achieved by outsourcing all non-

core business activities to a third party business partner, which in turn will lead to an

improved integration through supply chain management. As companies focus on their

core activities and outsource the rest, their success increasingly depends on their ability

to control what happens in the value chain outside their own boundaries (Magretta

2000: 29 - 59). Supply chain leaders are thus reconsidering the linkages, not only

between functions within their own companies, but also with other

An Introduction to Supply Chain Management

This free online course helps you manage your supply chain operations and processes successfully.

Supply chain management is one of the many new management tactics that have emerged and rapidly developed across different industries worldwide. This course will help you understand supply chain systems, logistics and customer response principles. We explore global supply chain operations, warehouse management and the latest business concepts to help you improve your supply chain processes and boost your business' productivity.

3.3. Principles of Traceability

Understanding the importance of traceability in the supply chain, and how it ensures product integrity, safety, and compliance.

3

change and increasingly complex and global supply chains have created huge

challenges for all participants. Traditional channel structures and behaviours in the

industry's supply chains have not kept pace with these changes. In the markets of the

future, comprehensive management which collaborate the supply chain as a whole is

needed to fulfil the new demands set by players and consumers alike.

The hypothesis statement of this thesis is in part derived from the problem statement.

This hypothesis statement is discussed in the research methodology in Chapter 5 under

point 5.3.3 and is stated as follows:

“Record Companies in the South African Recording Industry should outsource

all their non-core business activities to one strategic business partner.”

It is clear to see how this statement is derived from the problem statement of this thesis,

as described here in point 1.1.1. This statement, as well as the opportunities and

problems it may present, is the core around which this thesis cent

3.4 Software Engineering Basics:

Introduction to software engineering principles and methodologies that are applicable to the development of supply chain management systems.:9
(c) The study design
The design of the research study was drafted in accordance with the prescribed
methodology of a proper research proposal that were explained in point 1.2.1.1
above.
(d) Sampling and data capturing
Sampling and data capturing of all information gathered from research as well as
from interviews with targeted players in the recording industry are utilised. Employees of record companies, music dealers, compact disc manufacturers and
supply chain management (SCM) companies were contacted and interviewed
through personal interviews, telephone conversations and electronic mails (refer
to the details of the respondents in Chapter 5 under point 5.4.3).
(e) Information evaluation
All researched data were scrutinised and reduced to a manageable quantity, where after it was used to develop summaries, conclusions and ultimately

the
new MODEL C in the last chapter.
(f) Information analysis
The gathered data and information were analysed, assigned with qualitative and
quantitive values and then interpreted

3.5 Supply Chain Digitalization

Exploring the role of digital technologies and software in transforming traditional supply chains into digital networks. The impact of change on logistics systems

Change can either be viewed as a thorny management issue, or as an important

competitive advantage. For logistics practitioners, change comes in many forms, for

example faster order cycle times, increasingly differentiated products and services and

ever more sophisticated technologies to help manage all of this complexity. One

consequence of these changes is the need for more dynamic and responsive logistics

systems that can readily adapt and respond to the changing needs and requirements.

This study will aim to prove that the key to mastering change as a competitive weapon

has two equally important facets: firstly the development of internal company

capabilities and competencies necessary to be truly productive, profitable and flexible,

and secondly to develop linkages and partnerships in the supply chain in order to reap

the optimum benefits of the logistics or supply chain management process.UUnniivvee rrss iittyy ooff PP rree ttoorriiaa ee ttdd –– SS ttee yynn,, MM MM ((22000055))

14

A logistics system can be termed a competitive advantage only to the extent that it

provides customers with products and services that they want or need, when they want

or need them. Once customer services strategies are identified, marketing and

distribution channels must be designed to perform to the required standards. Analytical

tools can be used to optimally allocate and deploy financial and human resources to

achieve desired levels of service in a logistics network. Preparing the business for

change and doing things differently, may be th

3.6 Data Management in Supply Chains

Understanding the importance of data management and analytics in optimizing supply chain operations and improving traceability.:

3.7 Blockchain for Supply Chain Traceability

Exploring the use of blockchain technology to enhance transparency and traceability in supply chains.

IoT and Smart Supply Chains

Investigating how the Internet of Things (IoT) enables real-time data collection and smart decision-making in supply chains.

3.8 Security and Privacy in Supply Chain Software:

Addressing the challenges of ensuring data security and privacy in supply chain management software solutions. onnectivity

The more people or businesses work together in a network or in a supply chain,

the higher the value of that network becomes. Internal connectivity as well as

connectivity to the outside world must not be rated as purely sufficient, but must

be seen to offer added value. In order to successfully manage either knowledge,

change, transformation or any other organisational issue, there needs to be

connectivity in the channel. Both connectivity (‘point b’ above) as well as speed

(discussed in ‘point c’ below) are needed to extract value from the above-

mentioned knowledge (in ‘point a’ above).

(c) Speed

Speed to market is vital. Getting the latest music release sold and delivered into

the trade and onto shop shelves before the competition will ensure at least an

initial market dominance. Just as important is speed of communication to

customers and suppliers (i.e. successful marketing as is discussed in Chapters 3

and 6). Most businesses operate in real time and need the correct and relevant

information available at the click of a button. This is one of the main advantagesUUnniivvee rrss iittyy ooff PP rree ttoorriiaa ee ttdd –– SS ttee yynn,, MM MM ((22000055))

3.9 Case Studies and Real-world Applications

Analyzing real-world cases of supply chain management and traceability using software solutions. Reduced risk

Reduced risk accompanied by an increase in certainty of demand can be

achieved. The more information gathered for the forecast (be it from the sales

and marketing team, or via the operations department), the lower the risk of

receiving unprepared-for orders becomes.

(b) Calculation of danger stock levels

By planning ahead and being aware of future orders, a company will be able to

calculate its needed stock levels. A reduction in inventory levels, which in turn

holds significant capital benefits, will be achieved by implementing the

information gained through the forecast.

(c) Production and human resource planning

Fewer staff will be needed to cover demand peaks, for example during the very

busy Christmas holiday shopping season when record companies usually

achieve their highest sales figures (refer to the sales graphs in Annexures C and

D at the end of the thesis). If the forecasting system is accurate, these increased

levels of demand can be anticipated and adequately planned for. The high

amounts of money, which usually needs to be spent on paying over-time

salaries, can then be drastically reduced.

(d) Better demand planning

A definite improvement in the visibility of the customer or the end-user’s

demand can be obtained. By collaborating the research and experience of all

divisions (operations, sales and marketing), a better idea can be formed of what

the needs of customers will be like in the future. This will lead to better planning

through the use of an improved forecasting system.

(e) Improved customer service

Improved customer service will be a direct result

Topics 4.

4.1 .12.15..4.1 Social Media Marketing for Real Estate, Rental, and Leasing

This course is designed to equip students with the skills and knowledge required to effectively leverage social media platforms for the marketing of real estate, rental, and leasing businesses. Students will learn to create engaging content, manage social media campaigns, and analyze performance metrics specific to the real estate sector.: It sounds like you have a curriculum outline! Are you looking to develop more details for these sections, or perhaps create some engaging content for the course? Here are a few ideas to expand on each topic:

4.1 Social Media Marketing for Real Estate, Rental, and Leasing

1. **Creating Engaging Content**
    - Techniques for capturing high-quality photos and videos of properties.
    - Writing compelling property descriptions and posts.
    - Utilizing virtual tours and 3D walkthroughs to enhance listings.
2. **Managing Social Media Campaigns**

- Strategies for targeting the right audience on platforms like Facebook, Instagram, and LinkedIn.
- Best practices for scheduling posts and maintaining consistency.
- Leveraging paid advertising and promotions to boost visibility.

3. **Analyzing Performance Metrics**
   - Key performance indicators (KPIs) specific to real estate, such as engagement rate, click-through rate (CTR), and lead generation.
   - Tools and software for tracking and reporting metrics.
   - Case studies and real-world examples of successful social media campaigns in real estate.

4.2 Introduction to Social Media Marketing

1. **Overview of Social Media Platforms**
   - Introduction to major platforms: Facebook, Instagram, Twitter, LinkedIn, TikTok, etc.
   - Understanding the unique features and audiences of each platform.
2. **Creating a Social Media Strategy**
   - Setting goals and objectives for social media marketing.
   - Identifying target audiences and crafting buyer personas.
   - Developing a content calendar and scheduling posts.
3. **Content Creation and Management**
   - Types of content: images, videos, stories, live streams, etc.
   - Tools and apps for creating and editing social media content.
   - Best practices for engaging and interactive posts.
4. **Analyzing and Optimizing Performance**

- Using analytics tools to measure success and ROI.
- Understanding key metrics and how to interpret them.
- Strategies for continuous improvement and staying up-to-date with trends.

I hope these ideas help you build out your course! Let me know if you need any more assistance or specific details.

4.2 Introduction to Social Media Marketing

Understanding the basic concepts of social media marketing and its importance in the real estate, rental, and leasing sectors.:

Understanding the Basic Concepts of Social Media Marketing

Social media marketing involves using platforms like Facebook, Instagram, Twitter, LinkedIn, and TikTok to promote products, services, or brands. The goal is to engage with potential customers, build relationships, and drive traffic to your website or listings.

Key Concepts:

- **Content Creation:** Developing engaging and relevant content that resonates with your target audience. This can include images, videos, blog posts, and infographics.
- **Audience Engagement:** Interacting with your followers through comments, messages, and posts to build a community and foster loyalty.
- **Analytics and Metrics:** Monitoring the performance of your social media campaigns using tools like Facebook Insights, Instagram Analytics, and Google Analytics. Key metrics include engagement rate, click-through rate (CTR), and conversions.
- **Advertising:** Utilizing paid advertising options on social media platforms to increase visibility and reach a broader audience. This includes sponsored posts, display ads, and retargeting campaigns.

Importance of Social Media Marketing in Real Estate, Rental, and Leasing

Social media marketing is especially important in these sectors because:

- **Visual Appeal:** Real estate relies heavily on visual content. High-quality photos, videos, and virtual tours of properties can attract potential buyers or renters.
- **Targeted Advertising:** Social media platforms allow you to target specific demographics, such as location, age, income level, and interests. This ensures your listings reach the right audience.
- **Brand Building:** Consistent and engaging social media presence helps build your brand's reputation and trustworthiness in the market.
- **Lead Generation:** Social media can be a powerful tool for generating leads. By engaging with your audience and providing valuable content, you can attract potential buyers or renters.
- **Cost-Effective:** Compared to traditional marketing methods, social media marketing can be more cost-effective and offer a higher return on investment (ROI).

By understanding these concepts and recognizing the importance of social media marketing, you can effectively promote your real estate, rental, or leasing business and stay competitive in the market.

Let me know if there's anything specific you'd like to explore further!

4.3 Target Audience Analysis

Identifying and understanding the target audience for real estate, rental, and leasing businesses on social media platforms.

4.4 Content Creation for Real Estate

Strategies for creating compelling content that attracts and retains the interest of potential clients on social media.: Target Audience Analysis for Real Estate, Rental, and Leasing on Social Media

Identifying and understanding your target audience is crucial for creating effective social media marketing strategies. Here’s how you can analyze your target audience in the real estate, rental, and leasing sectors:

1. Define Demographics

- **Age:** Identify the age groups most interested in buying, renting, or leasing properties. For example, millennials might be looking for first-time homebuying opportunities, while older generations might seek investment properties.
- **Location:** Focus on geographic areas where your potential customers are located. This could be specific cities, neighborhoods, or regions.
- **Income Level:** Determine the income bracket of your target audience to match them with appropriate properties.
- **Family Status:** Consider whether your audience includes singles, young couples, families, or retirees.

2. Understand Psychographics

4.5 Platform-Specific Strategies:

Learning to tailor marketing strategies for different social media platforms such as Facebook, Instagram, and LinkedIn.: Platform-Specific Strategies for Social Media Marketing

Tailoring your marketing strategies to different social media platforms is essential for maximizing engagement and reaching your target audience effectively. Here's how you can craft platform-specific strategies for Facebook, Instagram, and LinkedIn:

Facebook

1. **Audience Targeting**
    - Utilize Facebook's detailed targeting options to reach specific demographics, interests, and behaviors.
    - Create custom audiences based on your existing customer data and lookalike audiences to find new potential clients.

2. **Content Strategy**
    - Post a mix of engaging content, including property listings, client testimonials, industry news, and educational posts.

4.6 Social Media Advertising:

An overview of social media advertising options and best practices for real estate marketers.: **Facebook Ads**

- **Ad Formats:** Image ads, video ads, carousel ads (multiple images or videos), slideshow ads, collection ads (with an instant experience), and lead generation ads.
- **Targeting:** Demographic targeting, interest targeting, behavioral targeting, custom audiences (based on your own data), lookalike audiences (similar to your existing customers).
- **Placement:** Facebook Feed, Instagram Feed, Stories, Messenger, Audience Network.

 Instagram Ads

- **Ad Formats:** Photo ads, video ads,

Engagement and Community Building:

Techniques for engaging with followers and building a community around your real estate brand.

Metrics and Analytics: Engagement and Community Building

Building a strong community around your real estate brand is crucial for long-term success. Here are some techniques to engage with followers and foster a sense of community:

Techniques for Engaging with Followers

1. **Consistent Posting**
    - Post regularly to keep your audience engaged and informed. Use a content calendar to plan and schedule posts.

- Share a mix of content types, including property listings, market updates, client testimonials, and behind-the-scenes looks.

2. **Interactive Content**
    - Use polls, quizzes, and questions to encourage interaction.
    - Host live Q&A sessions or virtual tours to engage with your audience in real-time.
3. **Personalization**
    - Respond to comments and messages p

Understanding social media metrics and utilizing analytics tools to measure and enhance campaign performance.

1. Brand Reputation Management: **Transparency**
    - Be transparent about your business practices and any changes or updates.
    - Transparency builds trust and fosters a positive reputation.

Case Studies and Best Practices

Learning from successful social media marketing campaigns can provide valuable insights and inspiration. Here are a few best practices:

1. **Real Estate Case Study: Zillow**
    - **Strategy:** Zillow uses high-quality images and videos, informative articles, and market data to engage its audience.
    - **Success:** They have built a large and engaged following, positioning themselves as a trusted source of real estate information.
2. **Rental Property Case Study: Airbnb**
    - **Strategy:** Airbnb leverages user-generated content, such as guest photos and reviews, to build trust and showcase properties.

- **Success:** They have created a sense of community among hosts and guests, resulting in high engagement and loyalty.

3. **Leasing Business Case Study: WeWork**

   - **Strategy:** WeWork uses professional content, case studies, and success stories to highlight the benefits of their coworking spaces.

   - **Success:** They have established a strong brand presence and attracted a large audience of professionals and businesses.

By implementing these techniques and strategies, you can effectively engage with your followers, build a strong community around your real estate brand, and maintain a positive reputation on social media platforms.

If you need more detailed information or examples, feel free to ask!

Strategies for managing and maintaining a positive brand reputation on social media platforms.

4.6 Case Studies and Best Practices

Examining successful social media marketing campaigns in the real estate sector and identifying best practice

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.4.1 .12.15,,5.1 Advanced Telemedicine and Remote Healthcare Production

This course is designed for Master's students focusing on the integration of telemedicine and remote healthcare with media production in radio and television. It aims to equip students with the skills and knowledge necessary to produce informative, engaging, and impactful media content that addresses the growing field of telemedicine and remote healthcare delivery. This interdisciplinary course will cover media production techniques, storytelling, healthcare technologies, and ethical considerations in telehealth broadcasting.

5.2 Introduction to Telemedicine and Remote Healthcare: Advanced Telemedicine and Remote Healthcare Production

This course is tailored for Master's students who aim to integrate telemedicine and remote healthcare with media production in radio and television. The course equips students with the skills and knowledge to produce impactful media content in the rapidly growing field of telemedicine and remote healthcare delivery.

Key Topics:

1. **Media Production Techniques**
    - Basics of video and audio production.
    - Advanced editing techniques.
    - Production of live broadcasts and pre-recorded shows.
2. **Storytelling for Healthcare**
    - Crafting compelling stories around telehealth services.
    - Techniques for simplifying complex medical information for a general audience.
    - Use of patient testimonials and case studies.

Understanding the fundamentals of telemedicine, its history, current trends, and the potential impact on healthcare delivery.

5.3 Television and Radio Production Essentials:

Fundamental techniques in radio and television production including scriptwriting, audio/visual recording, editing, and broadcasting.: **Healthcare Technologies**

- Overview of telemedicine technologies: video conferencing tools, remote monitoring devices, and telehealth platforms.
- Integration of these technologies into media production.

 Ethical Considerations in Telehealth Broadcasting

- Privacy and confidentiality in telemedicine.
- Ethical dilemmas in telehealth storytelling.

- Regulations and guidelines for telehealth content production.

5.4 Medical Narrative and Storytelling

Crafting compelling stories that communicate complex healthcare concepts effectively to a diverse audience.: 5.3 Television and Radio Production Essentials

An introduction to the fundamentals of television and radio production, focusing on skills necessary for creating high-quality media content.

Key Topics:

1. **Television Production Basics**
    - Camera operation and techniques.
    - Lighting and sound design.
    - Directing and producing TV segments.
2. **Radio Production Basics**
    - Audio recording and editing.
    - Scriptwriting for radio broadcasts.
    - Hosting and interviewing techniques.
3. **Advanced Production Skills**

5.6 Remote Healthcare Technologies and Innovations:

Exploring the latest telehealth technologies, including devices, software platforms, and innovations that enable remote healthcare.

1. 5.7 Ethical and Legal Considerations in Telehealth Media: **dvanced Production Skills**
    - Multi-camera setups and live broadcasting.

- Post-production editing and special effects.
- Integrating graphics and animations.

2. **Production Software**
    - Familiarity with industry-standard software like Adobe Premiere, Final Cut Pro, and Audacity.
    - Best practices for efficient and effective media production.

These topics and courses will provide students with a comprehensive understanding of telemedicine and remote healthcare, along with the skills to produce engaging and informative media content.

If you need more details or have specific questions about any of these sections, feel free to let me know!

Understanding the ethical and legal implications of broadcasting telemedicine content, including patient privacy and data protection.

5.8 Producing Engaging Content for Healthcare: reating captivating and informative healthcare content for radio and television requires a blend of creativity, storytelling, and technical skills. Here are some techniques and strategies:

1. **Storytelling Techniques**
    - **Personal Narratives:** Use patient stories and testimonials to humanize healthcare topics and create emotional connections with the audience.
    - **Simplifying Complex Information:** Break down medical jargon into understandable language using analogies and visuals.
    - **Engagement Hooks:** Start with a compelling hook, such as an intriguing fact, question, or scenario, to grab the audience's attention.

2. **Visual and Audio Elements**

- **High-Quality Production:** Invest in good lighting, sound, and camera equipment to ensure professional-looking and sounding content.
- **Visual Aids:** Use graphics, animations, and infographics to illustrate complex concepts and data.
- **Sound Design:** Use background music

Techniques and strategies for producing engaging and educational healthcare content for radio and television.

5.9 Audience Engagement and Feedback in Healthcare Broadcasting

Tools and methods for measuring and analyzing audience engagement and feedback to improve healthcare programming.

5.10 Case Studies and Best Practices: Reviewing successful telemedicine and remote healthcare media projects can provide valuable insights and inspiration. Here are some best practices and case studies:

1. **Case Study: Mayo Clinic**
    - **Overview:** The Mayo Clinic produces high-quality video content featuring expert interviews, patient stories, and educational segments.
    - **Success Factors:** Professional production quality, clear and concise information, and a focus on patient-centered care have contributed to their success.
2. **Case Study: Cleveland Clinic**
    - **Overview:** Cleveland Clinic utilizes live streaming for virtual health talks and Q&A sessions with medical experts.
    - **Success Factors:** Interactive content, real-time engagement, and collaboration with healthcare professionals have enhanced their reach and credibility.
3. **Case Study: BBC Health Check**

- **Overview:** BBC's "Health Check" program provides in-depth coverage of global health issues with expert analysis and field reports.
- **Success Factors:** Comprehensive research, diverse perspectives, and high journalistic standards have made the program a trusted source of health information.

4. **Best Practices**
   - **Research-Driven Content:** Base your content on thorough research and verified information to ensure accuracy and reliability.
   - **Audience-Centered Approach:** Focus on the needs and interests of your audience to create relevant and engaging content.
   - **Continuous Improvement:** Regularly review and analyze feedback and performance metrics to refine and enhance your programming.

These strategies and case studies can help you produce engaging and educational healthcare content, effectively measure audience engagement, and maintain a positive brand reputation in telemedicine and remote healthcare broadcasting.

If you need more details or have specific questions, feel free to let me know!

Review and analysis of successful telemedicine and remote healthcare media projects and their production processes.

5.11 Future Trends in Telemedicine and Media Integration

Exploring future trends in telemedicine and how media can adapt to new healthcare delivery models.

Topics 6

4.1 .12.15.6.1 Technical Writing for Technology

This course is designed to prepare students with the skills and knowledge necessary to effectively communicate complex technical information. Through a blend of theory and practical application, students will learn how to write manuals, guides, and reports in a way that is clear, concise, and accessible to various audiences within the technological field.

6.2 Introduction to Technical Writing

An overview of technical writing, its significance in the tech industry, and the roles and responsibilities of a technical writer.: Key Topics:

1. **Fundamentals of Technical Writing**
    - Understanding the purpose and scope of technical writing.
    - Characteristics of effective technical documentation.
    - Writing for different audiences: experts, technicians, and laypersons.
2. **Writing Manuals and Guides**
    - Structure and components of user manuals and guides.
    - Techniques for breaking down complex processes into simple steps.
    - Use of diagrams, flowcharts, and other visual aid

6.3 Understanding Your Audience:

Learn how to identify and write for different audience levels, ensuring your writing is accessible and understood by your intended readers.: **reating Technical Reports**

- Types of technical reports: feasibility reports, progress reports, and research reports.
- Organizing and structuring technical reports.

- Writing clear and concise executive summaries, conclusions, and recommendations.

Documenting Software and Hardware

- Writing API documentation and software user guides.
- Creating installation guides and troubleshooting manuals for hardware products.
- Techniques for ensuring accuracy and clarity in technical documentation.

Editing and Proofreading

- Best practices for editing and proofreading technical documents.
- Common errors and how to avoid them.
- Tools and software for technical editing and proofreading

6.4 Research and Information Gathering: **Primary Data Sources**

- **Interviews:** Conduct interviews with subject matter experts (SMEs), stakeholders, and users to gather firsthand information.
- **Surveys and Questionnaires:** Distribute surveys and questionnaires to collect data directly from your target audience.
- **Observations:** Observe processes, product usage, and workflows to gain a better understanding of the subject matter.
- **Experiments and Testing:** Conduct experiments or tests to gather empirical data.

Secondary Data Sources

- **Literature Review:** Review existing literature, such as academic papers, books, and industry reports, to gather background information and context.
- **Online Databases:** Use online databases like PubMed, IEEE Xplore, and Google Scholar to find relevant research articles and publications.

- **Industry Websites and Blogs:** Follow reputable industry websites, blogs, and forums to stay updated on the latest trends and developments.
- **Company Documentation:** Refer to internal documentation, such as technical specifications, user manuals, and whitepapers, to gather re

Techniques for conducting research and gathering information, including primary and secondary data sources.

6.5 Document Design and Formatting: **Layout**

- **Structure:** Organize content logically with clear headings, subheadings, and sections.
- **Whitespace:** Use adequate whitespace to prevent clutter and improve readability.
- **Alignment:** Ensure consistent alignment of text, images, and other elements.

 Typography

- **Font Choice:** Select legible fonts that are easy to read on both screen and print. Avoid using too many different fonts.
- **Font Size and Style:** Use appropriate font sizes and styles for headings, subheadings, and body text to create a clear hierarchy.
- **Line Spacing:** Use adequate line spacing to make the text more readable.

 Visuals

- **Images and Diagrams:** Include relevant images, diagrams, and charts to illustrate complex concepts and data.
- **Captions and Labels:** Provide clear captions and labels for all visuals to enhance understanding.
- **Consistency:** Maintain consistent formatting and styling for all visuals throughout the document.

Explore the principles of effective document design, including layout, typography, and the use of visuals to aid understanding.

6.7 Writing Manuals and Guides: Writing effective instructional materials, such as user manuals and guides, requires clarity and precision. Here are some methods:

1. **Understand the Audience**
    - **Identify Needs:** Determine the needs and skill levels of your audience to tailor the content accordingly.
    - **User Personas:** Create user personas to represent different types of users and their requirements.
2. **Structure and Organization**
    - **Table of Contents:** Provide a clear and comprehensive table of contents for easy navigation.
    - **Step-by-Step Instructions:** Break down processes into simple, sequential steps. Use numbered lists and bullet points for clarity.
    - **Sections and Subsections:** Organize content into sections and subsections to make it easier to follow.
3. **Clarity and Conciseness**
    - **Simple Language:** Use clear and concise language. Avoid jargon and technical terms unless necessary, and provide explanations when used.
    - **Examples and Scenarios:** Include examples and scenarios to illustrate how to perform tasks and troubleshoot issues.
    - **Testing:** Test the instructions with real users to identify any areas of confusion and make necessary revisions.

Detailed methods for writing instructional materials, such as user manuals and guides.

6.8 Using Technology Tools for Technical Writing: Leveraging technology tools can enhance the efficiency and quality of technical writing. Here are some tools to consider:

1. **Writing and Editing Tools**
    - **Microsoft Word:** A versatile word processor with features for writing, formatting, and collaboration.
    - **Google Docs:** A cloud-based word processor that enables real-time collaboration and sharing.
    - **Markdown Editors:** Tools like Typora and Dillinger for writing in Markdown, a lightweight markup language.
2. **Content Management Systems (CMS)**
    - **MadCap Flare:** A powerful CMS designed for technical writers to create and manage documentation.
    - **Adobe FrameMaker:** A professional tool for creating structured documents and long-format content.
    - **Paligo:** A cloud-based CMS for creating, managing, and publishing technical documentation.
3. **Graphics and Visualization Tools**
    - **Adobe Illustrator:** A vector graphics editor for creating detailed diagrams and illustrations.
    - **Snagit:** A screen capture and recording tool for creating annotated screenshots and videos.
    - **Lucidchart:** A web-based tool for creating flowcharts, diagrams, and other visual content.
4. **Collaboration and Project Management Tools**
    - **Trello:** A project management tool that uses boards, lists, and cards to organize tasks and collaborate with team members.
    - **Asana:** A project management tool for tracking tasks, deadlines, and team collaboration.

- **Slack:** A communication tool for real-time messaging and file sharing among team members.

By mastering these techniques and tools, students will be well-prepared to conduct research, design effective documents, write instructional materials, and leverage technology to enhance their technical writing skills.

Introduction to software and tools commonly used in technical writing, such as content management systems, version control systems, and collaborative platforms.

6.9 Editing and Proofreading: Editing and Proofreading

Effective editing and proofreading are essential for ensuring clarity, consistency, and accuracy in technical documents. Here are some techniques to help you polish your work:

1. **Clarity and Consistency**
    - **Read Aloud:** Reading the document aloud can help identify awkward phrasing, unclear passages, and grammatical errors.
    - **Simplify Language:** Use plain language and avoid jargon or technical terms that may confuse the reader. Ensure that explanations are clear and concise.
    - **Consistency:** Maintain consistent terminology, formatting, and style throughout the document. Use a style guide to ensure uniformity.
2. **Editing Techniques**
    - **Content Review:** Focus on the overall structure and organization of the document. Ensure that the content is logically arranged and flows smoothly.
    - **Fact-Checking:** Verify all factual information, data, and references for accuracy. Ensure that technical specifications and details are correct.
    - **Peer Review:** Have colleagues or subject matter experts review the document for additional feedback and insights.
3. **Proofreading Methods**

- **Multiple Passes:** Proofread the document multiple times, focusing on different aspects each time (e.g., grammar, punctuation, spelling).
- **Take Breaks:** Take breaks between editing sessions to approach the document with fresh eyes.
- **Use Tools:** Utilize proofreading tools like Grammarly, Hemingway Editor, and Microsoft Word's built-in spelling and grammar checker.

6.10 Ethics in Technical Writing

Ethical considerations are crucial in technical writing to maintain integrity, transparency, and trust. Here are some key principles:

1. **Accuracy**
   - **Fact-Based Writing:** Ensure that all information presented is accurate, verifiable, and based on reliable sources.
   - **Avoiding Misleading Information:** Do not exaggerate or misrepresent information. Present data and findings honestly and transparently.
2. **Transparency**
   - **Disclosing Sources:** Always cite sources and references for data, quotes, and research. Provide clear attributions to avoid plagiarism.
   - **Open Communication:** Be transparent about any potential conflicts of interest or biases that may affect the content.

Techniques for ensuring clarity and consistency, and methods to effectively edit and proofread technical documents.

6.10 Ethics in Technical Writing

Understanding the ethical implications and responsibilities of being a technical writer, focusing on accuracy, transparency, and avoiding plagiarism.

6.12 Effective Communication in Teams

Strategies for effective collaboration and communication within project teams, including the role of dffective communication is vital for successful collaboration in technical writing teams. Here are some strategies to enhance team communication:

1. **Clear and Open Communication**
    - **Regular Meetings:** Hold regular team meetings to discuss project progress, address concerns, and share updates.
    - **Communication Channels:** Utilize communication tools like email, Slack, or Microsoft Teams to facilitate real-time collaboration.
2. **Active Listening**
    - **Listening Skills:** Practice active listening by paying attention, asking clarifying questions, and acknowledging others' input.
    - **Feedback:** Provide constructive feedback and be open to receiving feedback from team members.
3. **Role Clarity**
    - **Defined Roles:** Clearly define roles and responsibilities within the team to avoid confusion and overlap.
    - **Documentation:** Document roles, tasks, and deadlines to ensure everyone is on the same page.
4. **Collaborative Tools**
    - **Project Management Tools:** Use tools like Trello, Asana, or Jira to track tasks, deadlines, and project milestones.
    - **Document Collaboration:** Utilize collaborative writing tools like Google Docs or Microsoft Word Online to enable real-time editing and comments.
5. **Conflict Resolution**
    - **Addressing Conflicts:** Address conflicts promptly and professionally. Encourage open dialogue to find mutually agreeable solutions.

- **Mediation:** Involve a neutral third party if needed to mediate and resolve conflicts.

By mastering these techniques and strategies, students will be well-prepared to edit and proofread technical documents, uphold ethical standards, and communicate effectively within teams.

If you need more details or have specific questions on any of these topics, feel free to let me know!

7topics :

4.1 .12.15.7.1.Masters in Vertical Farming and Urban Agriculture with Focus on Synthetic Biology

This course explores the intersection of vertical farming, urban agriculture, and synthetic biology, preparing students to innovate in sustainable food production. Students will gain theoretical knowledge and practical skills to design and implement urban farming systems that leverage synthetic biology for enhanced productivity and sustainability.

7.2Introduction to Vertical Farming and Urban Agriculture

An overview of vertical farming and urban agriculture, their roles in modern food production, and how they contribute to sustainability.: n overview of vertical farming and urban agriculture, their roles in modern food production, and how they contribute to sustainability.

Key Topics:

- **Definitions and Concepts:** Understanding what vertical farming and urban agriculture entail.
- **Historical Development:** Tracing the evolution of these farming techniques.
- **Sustainability Contributions:** How these methods reduce the carbon footprint and promote resource efficiency.

7.3.Fundamentals of Synthetic Biology

Study the basic principles of synthetic biology, including DNA sequencing, genetic engineering, and how these tools are used to optimize plant growth.: Fundamentals of Synthetic Biology

Study the basic principles of synthetic biology, including DNA sequencing, genetic engineering, and how these tools are used to optimize plant growth.

Key Topics:

- **Introduction to Synthetic Biology:** Basic concepts and terminology.
- **DNA Sequencing and Genetic Engineering:** Techniques and applications.
- **Plant Optimization:** How synthetic biology enhances plant growth and resilience

7.4..Applications of Synthetic Biology in Urban Agriculture

Explore how synthetic biology is revolutionizing urban farming, including genetically modified organisms and engineered biosystems that improve crop yield.:

7.6Design of Vertical Farming Systems

Learn the architectural and systems design principles for creating efficient vertical farms in urban environments.: Explore how synthetic biology is revolutionizing urban farming, including genetically modified organisms (GMOs) and engineered biosystems that improve crop yield.

Key Topics:

- **GMOs in Urban Farming:** Benefits and challenges.
- **Engineered Biosystems:** Innovations that enhance productivity and sustainability.
- **Case Studies:** Examples of successful applications in urban agriculture.

7.7Integration of Biotechnology in Crop Production

Discuss the integration of biotechnology tools to enhance crop resilience, nutrient uptake, and pest resistance.: Explore the potential future advancements in vertical farming and synthetic biology.

Key Topics:

- **Innovative Technologies:** Emerging tools and techniques.
- **Sustainability Goals:** Advancing towards more sustainable and resilient food systems.
- **Research and Development:** Ongoing projects and future research directions.

These courses will provide students with a comprehensive understanding of the intersection between vertical farming, urban agriculture, and synthetic biology, equipping them to innovate and lead in the field of sustainable food production.

Feel free to ask if you need more details or specific information on any of these topics!

7.8.Environmental and Economic Impacts of Urban Agriculture

Evaluate the environmental and economic benefits and challenges posed by urban agriculture and vertical farming.

7.9.Regulatory and Ethical Considerations in Synthetic Biology

Examine the regulatory frameworks and ethical considerations associated with the use of synthetic biology in agriculture.: Regulatory frameworks for synthetic biology vary globallyRegulatory frameworks for synthetic biology vary globally

7.10Future Trends in Vertical Farming and Synthetic Biology

Explore the potential future advancements in vertical farming technologies and synthetic biology app **Equity and Access**: Ensuring fair access to the benefits of synthetic biology

8..topic

4.1 .12.15..8.Master's in Urban Water Supply, Sewerage, Waste Management, and Remediation Activities

8.1. This course delves into the complexities of urban infrastructure related to water supply, sewerage, waste management, and remediation activities. Students will explore the technical, environmental, and policy-related aspects of effective urban planning necessary to manage these essential services sustainably. The course equips graduates with the skills to address challenges related to population growth, urbanization, and climate change in water and waste sectors.

8.2.Introduction to Urban Water Supply Systems

Explore the components of urban water supply systems, including water sourcing, treatment, distribution, and quality management. Understand the challenges and technological advancements in managing urban water supply.:

Explore the components of urban water supply systems, including water sourcing, treatment, distribution, and quality management. Understand the challenges and technological advancements in managing urban water supply.

Key Topics:

- **Water Sourcing:** Identifying and managing sources of water such as rivers, lakes, and groundwater.
- **Water Treatment:** Processes for purifying water to meet safety and quality standards.
- **Distribution Systems:** Designing and maintaining networks for efficient water delivery.
- **Quality Management:** Monitoring and ensuring the quality of water supplied to urban areas.

8.3 Sewerage Systems Design and Manage

8.3.Sewerage Systems Design and Management

Learn about the engineering, design, and operational management of urban sewerage systems, focusing on sustainable practices and innovations in waste treatment and resource recovery.: Sewerage Systems Design and Management

Learn about the engineering, design, and operational management of urban sewerage systems, focusing on sustainable practices and innovations in waste treatment and resource recovery.

Key Topics:

- **Engineering Principles:** Understanding the fundamentals of sewerage system design.
- **Sustainable Practices:** Implementing environmentally friendly waste treatment methods.
- **Resource Recovery:** Techniques for reclaiming and repurposing resources from was

8.4.Urban Waste Management Strategies

Understand the principles and methods of waste management in urban areas, addressing : Understand the principles and methods of waste management in urban areas, addressing the complexities and challenges of managing solid and liquid waste effectively.

Key Topics:

- **Waste Collection and Disposal:** Strategies for efficient waste collection, segregation, and disposal.
- **Recycling and Reuse:** Promoting recycling and reuse to minimize waste generation.
- **Waste Reduction:** Implementing programs and policies to reduce overall waste output.

8.5.Remediation Activities and Technologies

Explore different technologies and methodologies used in the remediation of contaminated sites, focusing on both chemical and biological methods. Learn how to effectively integrate water supply, sewerage, and waste management into urban planning processes to create more sustainable and livable cities.

Key Topics:

- **Urban Planning Principles:** Incorporating water and waste considerations into urban design.
- **Interdisciplinary Approaches:** Collaborating with various stakeholders for holistic planning.
- **Sustainable Development Goals:** Aligning urban planning with global sustainability objectives.

These courses provide a comprehensive understanding of urban water supply, sewerage, waste management, and remediation activities, preparing students to tackle the challenges of modern urban infrastructure.

If you need more details or have specific questions on any of these topics, feel free to let me know!

8.6.Policy and Regulation in Urban Water and Waste

Gain insights into the regulatory frameworks and policies that govern urban water and waste management. Explore how legislation impacts planning and operational practices. Learn how to effectively integrate water supply, sewerage, and waste management into urban planning processes to create more sustainable and livable cities.

Key Topics:

- **Urban Planning Principles:** Incorporating water and waste considerations into urban design.
- **Interdisciplinary Approaches:** Collaborating with various stakeholders for holistic planning.
- **Sustainable Development Goals:** Aligning urban planning with global sustainability objectives.

These courses provide a comprehensive understanding of urban water supply, sewerage, waste management, and remediation activities, preparing students to tackle the challenges of modern urban infrastructure.

If you need more details or have specific questions on any of these topics, feel free to let me know!

8.7.Climate Change and its Impact on Water and Waste Management

Examine how climate change affects urban water and waste systems and explore adaptive strategies to enhance resilience and sustainability.

8.8..Sustainable Innovations in Water and Waste Systems

Discover emerging technologies and innovative practices for enhancing sustainability in urban water and waste management systems.: The pursuit of sustainability in urban water and waste management systems involves adopting emerging technologies and innovative practices. Here are some cutting-edge innovations:

Emerging Technologies:

1. **Smart Water Management Systems**
    - Utilize IoT sensors and real-time data analytics to monitor water quality, detect leaks, and optimize water usage.
    - Implement smart meters to provide accurate water consumption data and encourage conservation.
2. **Advanced Water Treatment Technologies**
    - Adopt membrane filtration, advanced oxidation processes, and nanotechnology to enhance water purification and recycling.

1. Use desalination technologies to convert seawater into **aste-to-Energy Technologies**
    - Convert organic waste into biogas through anaerobic digestion, reducing landfill waste and generating renewable energy.
    - Implement gasification and pyrolysis to transform solid waste into syngas and biochar.

2. **Decentralized Wastewater Treatment**
    - Develop decentralized systems that treat wastewater close to the source, reducing the need for extensive sewer networks and lowering energy consumption.
    - Use constructed wetlands and natural treatment systems for cost-effective and sustainable wastewater management.
3. **Green Infrastructure**
    - Integrate green roofs, permeable pavements, and rain gardens to manage stormwater and reduce urban heat islands.
    - Employ urban wetlands and bioswales to enhance natural water filtration and storage.

Innovative Practices:

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1. 8.9Integrating Water and Waste Systems into Urban Planning**Holistic Planning Approaches**
    - Adopt integrated planning frameworks that consider water and waste systems as interconnected components of urban infrastructure.
    - Use spatial planning tools to optimize the placement of water and waste facilities, minimizing environmental impact and maximizing efficiency.
2. **Sustainable Development Goals (SDGs)**
    - Align urban planning efforts with the United Nations Sustainable Development Goals, particularly SDG 6 (Clean Water and Sanitation) and SDG 11 (Sustainable Cities and Communities).
    - Promote sustainable land use practices that protect water resources and reduce waste generation.
3. **Interdisciplinary Collaboration**

- Foster collaboration among urban planners, engineers, environmental scientists, and policymakers to develop comprehensive solutions.

- Engage stakeholders, including local communities, businesses, and NGOs, in the planning process to ensure diverse perspectives and needs are addressed.

4. **Climate Resilience and Adaptation**

    - Incorporate climate resilience measures into urban planning to address the impacts of climate change on water and waste systems.

    - Develop adaptive strategies to manage extreme weather events, such as floods and droughts, and ensure the continuity of essential services.

5. **Green and Blue Infrastructure Integration**

    - Integrate green infrastructure (e.g., parks, green roofs) and blue infrastructure (e.g., rivers, lakes) into urban landscapes to enhance ecosystem services and improve water management.

    - Design urban spaces that promote natural water infiltration, reduce runoff, and support biodiversity.

6. **Data-Driven Decision Making**

    - Utilize Geographic Information Systems (GIS), remote sensing, and data analytics to inform planning decisions and monitor system performance.

    - Implement smart city technologies to enhance the management and operation of water and waste systems.

By adopting these strategies and embracing innovative technologies, urban planners can create more sustainable, resilient, and livable cities that effectively manage water and waste systems.

If you have any specific questions or need more detailed information on any of these topics, feel free to ask!

Learn how to effectively integrate water supply, sewerage, and waste management into urban planning processes to create more sustainable and livable cities.

9.topic

4.1 .12.15..9.1.Transportation and Warehousing in Tourism Planning and Development

This course offers a comprehensive study into how transportation and warehousing play a crucial role in tourism planning and development. Students will explore the logistics, infrastructure, and management strategies required to optimize tourism supply chains, improve accessibility, and enhance the overall tourist experience. This course provides insights into transportation modes, warehousing solutions, and policy frameworks essential for sustainable tourism development.

9.2..Introduction to Tourism Logistics

Explores the fundamental principles of logistics management within the tourism sector, emphasizing its role in seamless travel experiences. **ransportation Modes**

- **Air Travel:** Managing airport logistics, flight scheduling, and passenger services.
- **Rail and Road Transport:** Coordinating bus and rail services for tourists, ensuring efficient transit systems.
- **Maritime Travel:** Organizing ferry and cruise services, port management.

 Warehousing Solutions

- **Storage Facilities:** Designing and managing warehouses for tourism-related goods.
- **Inventory Management:** Techniques for maintaining op

9.3...Transportation Infrastructure in Tourism

Examines the various transportation infrastructures such as airports, seaports, and road networks that support the tourism industry. **Policy Frameworks**

- **Regulatory Compliance:** Understanding laws and regulations affecting transportation and warehousing in tourism.
- **Sustainability Policies:** Implementing eco-friendly practices to minimize environmental impact.

9.4..Role of Warehousing in Tourism

Discusses how warehousing and inventory management contribute to the efficiency of tourism operations. **ogistics and Infrastructure**

- **Supply Chain Management:** Strategies for efficient coordination of suppliers, transporters, and retailers.
- **Infrastructure Development:** Planning and constructing facilities to support tourism activities.
- **Technology Integration:** Using digital tools for tracking, scheduling, and management.

9.5..Sustainable Transport Solutions

Covers sustainable practices and innovations in transportation that minimize environmental impact and promote eco-friendly tourism. **Accessibility Improvement**

- **Barrier-Free Travel:** Designing inclusive transportation systems for travelers with disabilities.
- **Connectivity Enhancement:** Ensuring seamless transitions between different modes of transport.

9.6..Tourism Supply Chain Management

Analyzes the intricacies of supply chain management specifically in the tourism sector, including challenges and best practices. **Logistics Management Fundamentals**

- **Definition and Scope:** Understanding what tourism logistics encompasses.
- **Key Components:** Identifying the main elements of tourism logistics, such as transportation, warehousing, and inventory management.

 Role in Seamless Travel Experiences

- **Customer Satisfaction:** Ensuring tourists have smooth and enjoyable experiences from arrival to departure.
- **Efficiency and Reliability:** Improving the efficiency and reliability of travel services through effective logistics.

9.7.Policy and Regulations in Tourism Transport

Explores the regulations and policies affecting transportation and warehousing, and how they influence tourism development. **ogistics Challenges in Tourism**

- **Seasonal Demand:** Managing fluctuations in demand due to tourist seasons.
- **Coordination Complexity:** Overcoming challenges in coordinating multiple service providers and stakeholders.

 Technological Advancements

- **Digital Solutions:** Utilizing technology to streamline logistics processes, such as online booking systems and real-time tracking.
- **Data Analytics:** Leveraging data to predict trends, optimize routes, and improve service delivery.

9.8.Innovations in Tourism Warehousing

Investigates recent technological advancements in warehousing that support tourism industry needs. 9.8 Innovations in Tourism Warehousing

This section investigates recent technological advancements in warehousing that support the tourism industry's needs. Some notable innovations include:

Technological Advancements:

1. **Smart Warehousing:** Automation and AI-driven inventory management systems optimize workflows and reduce human error

9.9..Case Studies on Tourism and Logistics

Presents case studies highlighting logistics success and challenges in various tourism destinations. his section presents case studies highlighting logistics success and challenges in various tourism destinations. Some examples include:

Case Studies:

1. **Public Policy Co-Creation in Recife:** Examines the creative tourism plan development process in Recife, Brazil

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10.topics

4.1 .12.15.10.1..Spatial Computing in Telecommunications

This course explores the integration of spatial computing technologies within the telecommunications sector. Students will gain an understanding of how spatial data is utilized to enhance network efficiencies, improve service delivery, and innovate telecommunications solutions. Covering foundational concepts to advanced applications, the course is designed for those aiming to lead in the evolution of telecom networks through spatial computing innovations.

10.2..Introduction to Spatial Computing

This topic covers the basics of spatial computing, its historical evolution, and its current importance across various industries, with a particular focus on telecommunications. Key Topics:

1. **Foundational Concepts**
    - **Spatial Data:** Understanding the types of spatial data, including geographic information systems (GIS), location-based services (LBS), and remote sensing.
    - **Spatial Computing Principles:** Basic principles of spatial computing, including spatial analysis, data visualization, and geospatial intelligence.
2. **Network Efficiencies**
    - **Optimizing Network Design:** Utilizing spatial data to design more efficient and reliable telecommunications networks.

10.3..Spatial Data and Telecommunications

- An exploration of the types and sources of spatial data utilized in telecommunications, as well as methods for data collection and management.

  Resource Allocation: Applying spatial analysis to optimize the allocation of network resources and infrastructure placement.

 Service Delivery Improvements

- **Location-Based Services:** Enhancing service delivery through the integration of location-based services and personalized user experiences.
- **Coverage Mapping:** Using spatial data to identify coverage gaps and optimize network coverage.

10.4..Geographical Information Systems (GIS) in Telecom

This topic discusses the application of GIS technologies for network planning, resource optimization, and service provisioning in telecommunications. **nnovative Solutions**

- **Smart Cities:** Leveraging spatial computing to develop smart city solutions that integrate telecommunications with urban infrastructure.

- **Augmented Reality (AR) and Virtual Reality (VR):** Exploring the applications of AR and VR in telecommunications, such as immersive communication experiences and virtual site inspections.

10.5..Network Planning and Optimization Using Spatial Computing

Strategies for using spatial computing to optimize telecom network deployments and enhancements through simulation and analytic tools.

10.6.Spatial Data Analytics for Telecom

An examination of analytic techniques and algorithms that leverage spatial data to provide insights and performance improvements in telecom services.
Advanced Applications

- **5G and Beyond:** Investigating the role of spatial computing in the deployment and optimization of 5G networks and future technologies.

- **Predictive Analytics:** Using spatial data for predictive analytics to anticipate network demands and prevent service disruption

10.7..Augmented Reality (AR) in Telecommunication Services

Understanding the role of AR technologies in enhancing customer experiences and operational efficiencies within telecom services. This topic covers the basics of spatial computing, its historical evolution, and its current importance across various industries, with a particular focus on telecommunications.

Key Topics:

1. **Basics of Spatial Computing**
    - **Definition and Scope:** Understanding what spatial computing entails and its applications.

- **Key Components:** Identifying the main elements of spatial computing, such as spatial data, geospatial analysis, and visualization.

2. **Historical Evolution**

    - **Early Developments:** Tracing the origins of spatial computing from early cartography and geographic information systems (GIS).

    - **Technological Advancements:** Highlighting key technological advancements that have shaped the field, such as remote sensing and GPS technol

10.11..5G and Spatial Computing

1. Investigating how 5G technology benefits from spatial computing, including precise location services and improved connectivity solutions. **urrent Importance**

    - **Cross-Industry Applications:** Exploring how spatial computing is used in various industries, including transportation, healthcare, retail, and agriculture.

    - **Focus on Telecommunications:** Examining the specific applications of spatial computing in telecommunications, such as network planning, coverage optimization, and location-based services.

These courses provide students with a comprehensive understanding of spatial computing and its transformative impact on telecommunications, preparing them to lead in the innovation and optimization of telecom networks.

If you have any specific questions or need more details on a

10.12..Privacy and Security in Spatial Telecommunications

A look into the potential security and privacy challenges posed by spatial data in telecommunications and strate,

Key Challenges:

1. **Data Privacy Concerns**: The extensive collection and transmission of spatial data can lead to unauthorized access and potential privacy breaches

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11..topics

4.1 .12.15..11.1..Advanced Legal Studies in Public Administration and Safety

This course is designed for Master's level students pursuing a degree in Public Administration and Safety with a focus on Legal Studies. It aims to provide students with a comprehensive understanding of the legal frameworks and principles that underpin public administration and safety mechanisms. The course covers a range of topics, from constitutional law and administrative law to policy-making and legal ethics, equipping students with the skills needed to navigate the complex legal landscape within the public sector.

11.2Introduction to Public Law

An overview of the principles and functions of public law, including constitutional and administrative law, which regulate the relationship between individuals and the state.

An overview of the principles and functions of public law, including constitutional and administrative law, which regulate the relationship between individuals and the state.

Key Topics:

- **Principles of Public Law:** Understanding the foundational concepts of public law.
- **Constitutional Law:** Examining the structure and functions of the constitution in regulating state authority.
- **Administrative Law:** Exploring the rules that govern the actions of administrative agencies.

11.3.Constitutional Law and Governance

Exploration of constitutional principles and how they guide governance and the formation of public policies. Exploration of constitutional principles and how they guide governance and the formation of public policies.

Key Topics:

- **Constitutional Principles:** Understanding fundamental principles like the rule of law, separation of powers, and checks and balances.
- **Governance:** Analyzing how constitutional principles influence the design and functioning of government institutions.
- **Public Policy Formation:** Examining the role of constitutional law in shaping public policies.

11.4.Administrative Law

Understanding the rules and regulations that govern the activities of administrative agencies of government. Understanding the rules and regulations that govern the activities of administrative agencies of government.

Key Topics:

- **Administrative Agencies:** Exploring the creation, powers, and functions of administrative agencies.
- **Regulatory Frameworks:** Understanding the legal frameworks that regulate administrative actions.
- **Judicial Review:** Examining the mechanisms for reviewing administrative decisions

11.5.Legal Frameworks for Public Safety

Examination of the legal structures and policies designed to protect public safety and maintain order.

11.6..Ethics in Public Administration

Study of ethical principles and how they apply to decision-making processes in public administration. Examination of the legal structures and policies designed to protect public safety and maintain order.

Key Topics:

- **Public Safety Laws:** Analyzing laws and regulations aimed at protecting public safety.
- **Policy Development:** Understanding the process of developing and implementing public safety policies.
- **Enforcement Mechanisms:** Exploring the role of law enforcement agencies in maintaining public order.

11.7..Public Policy and Legal Implications

Analysis of the intersection of law and public policy and the impact of legal frameworks on policy formation. Study of ethical principles and how they apply to decision-making processes in public administration.

Key Topics:

- **Ethical Theories:** Understanding various ethical theories and their application in public administration.
- **Decision-Making:** Examining ethical considerations in decision-making processes.
- **Accountability:** Exploring mechanisms for ensuring ethical conduct and accountability in public administration.

Analysis of the intersection of law and public policy and the impact of legal frameworks on policy formation.

Key Topics:

- **Law and Policy:** Understanding the relationship between legal frameworks and public policy.
- **Policy Analysis:** Examining the legal implications of policy decisions.
- **Case Studies:** Analyzing real-world examples of law influencing public policy

11.8..Human Rights and Social Justice

Understanding the role of law in promoting human rights and social justice in public administration. Understanding the role of law in promoting human rights and social justice in public administration.

Key Topics:

- **Human Rights Law:** Exploring international and domestic human rights frameworks.
- **Social Justice:** Examining the role of law in addressing social inequalities and promoting justice.
- **Advocacy:** Understanding the

11.9.Crisis Management and Legal Compliance

Strategies for managing crises in public administration while ensuring compliance with legal standards. Strategies for managing crises in public administration, ensuring legal compliance, and maintaining order.

Key Topics:

- **Crisis Management:** Developing strategies for effectively managing crises in public administration.
- **Legal Compliance:** Ensuring adherence to legal frameworks during crisis situations.
- **Contingency Planning:** Creating plans for maintaining public safety and order during emergencies.

These courses provide students with a comprehensive understanding of the legal aspects of public administration and safety, preparing them to navigate the complex legal landscape in the public sector.

If you have any specific questions or need more details on any of these topics, feel free t

12.topic

4.1 .12.15..12.1Metallurgy in Oil and Gas Production, Refining, and Transport

This course provides an in-depth understanding of the metallurgical principles and practices specific to the oil and gas industry. Students will explore the selection, processing, and performance of metals used in various segments of the industry, focusing on their application in production, refining, and transport operations. The course aims to develop a comprehensive knowledge of material selection and corrosion prevention in harsh oil and gas environments.

12.2..Introduction to Metallurgy in Oil and Gas

An overview of the role of metallurgy in the oil and gas industry, discussing the importance of material selection and analyzing common metallurgical challenges faced.

his course provides an in-depth understanding of the metallurgical principles and practices specific to the oil and gas industry. Students will explore the selection, processing, and performance of metals used in various segments of the industry, focusing on their application in production, refining, and transport operations. The course aims to develop a comprehensive knowledge of material selection and corrosion prevention in harsh oil and gas environments.

12.3..Material Selection for Oil and Gas Production

Examines criteria for selecting materials, focusing on mechanical properties and corrosion resistance required in production environments.

An overview of the role of metallurgy in the oil and gas industry, discussing the importance of material selection and analyzing common metallurgical challenges faced.

Key Topics:

- **Role of Metallurgy:** Understanding the critical importance of metallurgy in oil and gas operations.
- **Material Selection:** Factors influencing the selection of materials for different segments of the industry.

- **Common Challenges:** Identifying and addressing common metallurgical issues, such as corrosion and material degradation.

12.4..Corrosion Mechanisms and Prevention

Explores common corrosion mechanisms in oil and gas environments, such as sulfide stress cracking and chloride stress corrosion, and presents methods for their prevention. Examines criteria for selecting materials, focusing on mechanical properties and corrosion resistance required in production environments.

Key Topics:

- **Mechanical Properties:** Evaluating the strength, toughness, and durability of materials.
- **Corrosion Resistance:** Understanding the importance of corrosion resistance in harsh environments.
- **Material Criteria:** Criteria for selecting suitable materials for production equipment and infrastructure.

12.5..Metallurgical Processes in Refining

Discusses how metallurgical processes like heat treatment and welding are utilized in refining operations to enhance material properties. Corrosion Mechanisms and Prevention

Explores common corrosion mechanisms in oil and gas environments, such as sulfide stress cracking and chloride stress corrosion, and presents methods for their prevention.

Key Topics:

- **Corrosion Mechanisms:** Understanding different types of corrosion and their causes.
- **Sulfide Stress Cracking:** Examining how sulfide stress cracking occurs and how to prevent it.

- **Chloride Stress Corrosion:** Exploring the effects of chloride stress corrosion and prevention methods.

12.6..Pipeline Materials and Design

Addresses the materials and design considerations for constructing oil and gas pipelines, including the assessment of failure modes and maintenance practices. iscusses how metallurgical processes like heat treatment and welding are utilized in refining operations to enhance material properties.

Key Topics:

- **Heat Treatment:** Techniques for enhancing the mechanical properties of metals through heat treatment.
- **Welding:** Best practices for welding in refining operations.
- **Material Enhancement:** Methods for improving the performance and longevity of materials used in refining.

12.7.Advanced Coatings and Surface Treatments

Focuses on the application of advanced coatings and surface treatments to protect metals used in oil and gas industry environments. Addresses the materials and design considerations for constructing oil and gas pipelines, including the assessment of failure modes and maintenance practices.

Key Topics:

- **Material Selection for Pipelines:** Criteria for selecting materials for pipeline construction.
- **Pipeline Design:** Principles of pipeline design to ensure safety and reliability.
- **Failure Modes:** Identifying common failure modes and strategies for prevention.
- **Maintenance Practices:** Best practices for maintaining pipeline integrity

Advanced Coatings and Surface Treatments

Focuses on the application of advanced coatings and surface treatments to protect metals used in oil and gas industry environments.

Key Topics:

- **Coating Technologies:** Exploring different types of coatings and their applications.
- **Surface Treatments:** Techniques for treating metal surfaces to enhance durability and resistance to corrosion.
- **Protective Measures:** Implementing protective measures to extend the lifespan of equipment.

12.8.Environmental Impact and Sustainability in Metallurgy

Evaluates the environmental impact of metallurgical practices in the oil and gas industry and explores sustainable practices and innovations. Evaluates the environmental impact of metallurgical practices in the oil and gas industry and explores sustainable practices and innovations.

Key Topics:

- **Environmental Impact:** Assessing the environmental consequences of metallurgical activities.
- **Sustainable Practices:** Implementing eco-friendly practices in metallurgy.
- **Innovations:** Exploring technological innovations for reducing environmental imp

12.9..Failure Analysis and Case Studies

Explores methods for conducting failure analysis on metallurgical components and reviews real-world case studies. Evaluates the environmental impact of metallurgical practices in the oil and gas industry and explores sustainable practices and innovations.

Key Topics:

- **Environmental Impact:** Assessing the environmental consequences of metallurgical activities.
- **Sustainable Practices:** Implementing eco-friendly practices in metallurgy.
- **Innovations:** Exploring technological innovations for reducing environmental imp

Explores methods for conducting failure analysis on metallurgical components and reviews real-world case studies.

Key Topics:

- **Failure Analysis Techniques:** Methods for analyzing and diagnosing material failures.
- **Case Studies:** Reviewing real-world examples of metallurgical failures and the lessons learned.
- **Preventive Measures:** Developing strategies to prevent future failur

12.10Future Trends in Metallurgy for Oil and Gas

Discusses emerging trends and technological advancements in metallurgy that could shape the future of the oil and gas industry. Discusses emerging trends and technological advancements in metallurgy that could shape the future of the oil and gas industry.

Key Topics:

- **Emerging Technologies:** Exploring new technologies and their potential impact on metallurgy.
- **Industry Trends:** Identifying trends that are likely to influence the future of metallurgy in the oil and gas sector.
- **Research and Development:** Current and future research initiatives aimed at advancing metallurgical practices.

These courses provide a comprehensive understanding of metallurgical principles and practices tailored to the oil and gas industry, equipping students with the knowledge and skills necessary to address the unique challenges of this field.

If you need more details or specific information on any of these topics, feel fr

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13.Topics:

4.1 .12.15..13.1.Integrated Water Management in Mining

This course provides an in-depth analysis of integrated water management practices within the mining industry. It covers sustainable management and conservation of water resources, focusing on balancing economic, environmental, and societal needs. The course examines technological advances, regulatory frameworks, and case studies, aimed at equipping students with the knowledge and skills necessary for effective water management in mining operations.

13.2.Introduction to Mining Water Management

Overview of water use in mining operations, including extraction, processing, and remediation. Discusses the significance of integrated water management and its role in sustainable mining.

13.2.Water Resource Evaluation and Planning

Methods for evaluating water resources at mining sites, including hydrological assessments and water balance studies. Covers planning frameworks for sustainable water management.

13.3.Water Quality Management in Mining

Techniques for monitoring and managing water quality in mining contexts, including treatment technologies and pollution control measures.

13.4.Regulatory and Environmental Compliance

An overview of legal frameworks and environmental regulations affecting water use in mining. Discusses compliance strategies and reporting requirements.

13.5.Innovation and Technology in Water Management

Examination of advanced technologies and innovative approaches in water management, such as desalination, water recycling, and smart water systems.

13.6.Stakeholder Engagement and Social License

The importance of engaging with stakeholders and communities regarding water management in mining. Covers strategies for maintaining a social license to operate.

13.7..Climate Change Impacts on Water Resources

Analyzes the effects of climate change on water availability and management in mining operations. Discusses adaptation strategies for minimizing risks.

13.8.Case Studies and Best Practices

Review of real-world examples of successful water management in mining operations. Discusses lessons learned and best practices in the industry.

13.7.Future Trends in Mining Water Management

Explores anticipated future developments in water management technologies and policies in mining.

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13.2 Introduction to Mining Water Management

Overview of water use in mining operations, including extraction, processing, and remediation. Discusses the significance of integrated water management and its role in sustainable mining.

Key Topics:

- **Water Use in Mining:** Understanding the various stages of water use in mining operations, from extraction to processing and remediation.

- **Integrated Water Management:** The importance of a holistic approach to managing water resources sustainably.
- **Significance in Sustainable Mining:** How integrated water management contributes to sustainable mining practices.

13.3 Water Resource Evaluation and Planning

Methods for evaluating water resources at mining sites, including hydrological assessments and water balance studies. Covers planning frameworks for sustainable water management.

Key Topics:

- **Hydrological Assessments:** Techniques for assessing the availability and quality of water resources at mining sites.
- **Water Balance Studies:** Understanding the inputs and outputs of water within mining operations.
- **Planning Frameworks:** Developing comprehensive plans for sustainable water management.

13.4 Water Quality Management in Mining

Techniques for monitoring and managing water quality in mining contexts, including treatment technologies and pollution control measures.

Key Topics:

- **Water Quality Monitoring:** Methods for regularly assessing water quality.
- **Treatment Technologies:** Exploring technologies for treating contaminated water in mining operations.
- **Pollution Control:** Strategies for preventing and controlling pollution in mining environments.

13.5 Regulatory and Environmental Compliance

An overview of legal frameworks and environmental regulations affecting water use in mining. Discusses compliance strategies and reporting requirements.

Key Topics:

- **Legal Frameworks:** Understanding the regulations governing water use in mining.
- **Environmental Compliance:** Ensuring mining operations adhere to environmental standards.
- **Reporting Requirements:** Developing strategies for meeting regulatory reporting obligations.

13.6 Innovation and Technology in Water Management

Examination of advanced technologies and innovative approaches in water management, such as desalination, water recycling, and smart water systems.

Key Topics:

- **Desalination:** Using desalination technology to provide fresh water for mining operations.
- **Water Recycling:** Implementing recycling systems to reduce water consumption.
- **Smart Water Systems:** Leveraging digital technologies to optimize water management.

13.7 Stakeholder Engagement and Social License

The importance of engaging with stakeholders and communities regarding water management in mining. Covers strategies for maintaining a social license to operate.

Key Topics:

- **Stakeholder Engagement:** Techniques for effectively engaging with stakeholders.
- **Community Involvement:** Involving local communities in water management decisions.
- **Social License to Operate:** Building and maintaining trust with stakeholders.

13.8 Climate Change Impacts on Water Resources

Analyzes the effects of climate change on water availability and management in mining operations. Discusses adaptation strategies for minimizing risks.

Key Topics:

- **Climate Change Effects:** Understanding how climate change impacts water resources in mining.
- **Adaptation Strategies:** Developing strategies to adapt to changing water availability.
- **Risk Minimization:** Implementing measures to minimize risks associated with climate change.

13.9 Case Studies and Best Practices

Review of real-world examples of successful water management in mining operations. Discusses lessons learned and best practices in the industry.

Key Topics:

- **Successful Case Studies:** Examining examples of effective water management in mining.
- **Lessons Learned:** Identifying key takeaways from real-world cases.
- **Best Practices:** Establishing best practices for water management in mining.

13.10 Future Trends in Mining Water Management

Explores anticipated future developments in water management technologies and policies in mining.

Key Topics:

- **Emerging Technologies:** Investigating new technologies for water management.
- **Policy Developments:** Understanding how policies may evolve to support sustainable water management.

- **Future Directions:** Exploring potential future trends in water management for mining.

These courses provide a comprehensive understanding of integrated water management in the mining industry, equipping students with the knowledge and skills necessary for sustainable and effective water management practices.

If you need more details or specific information on any of these topics, feel free to ask!

14.topic

.4.1 .12.15.14.Integrated Water Management in Mining

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14.1.Introduction to Mining Water Management

Overview of water use in mining operations, including extraction, processing, and remediation. Discusses the significance of integrated water management and its role in sustainable mining.

14.2.Water Resource Evaluation and Planning

Methods for evaluating water resources at mining sites, including hydrological assessments and water balance studies. Covers planning frameworks for sustainable water management.

14.3Water Quality Management in Mining

Techniques for monitoring and managing water quality in mining contexts, including treatment technologies and pollution control measures.

14.4.Regulatory and Environmental Compliance

An overview of legal frameworks and environmental regulations affecting water use in mining. Discusses compliance strategies and reporting requirements.

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14 Integrated Water Management in Mining

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- **Hydrological Assessments:** Techniques for assessing the availability and quality of water resources at mining sites.
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- **Successful Case Studies:** Examining examples of effective water management in mining.
- **Lessons Learned:** Identifying key takeaways from real-world cases.
- **Best Practices:** Establishing best practices for water management in mining.

14.9 Future Trends in Mining Water Management

Explores anticipated future developments in water management technologies and policies in mining.

Key Topics:

- **Emerging Technologies:** Investigating new technologies for water management.
- **Policy Developments:** Understanding how policies may evolve to support sustainable water management.
- **Future Directions:** Exploring potential future trends in water management for mining.

These courses provide a comprehensive understanding of integrated water management in the mining industry, equipping students with the knowledge and skills necessary for sustainable and effective water management practices.

If you need more details or specific information on any of these topics, feel free to ask!

15.topics

4.1 .12.15..15.1.Advanced Manufacturing Techniques in Genetic Engineering

This course explores the convergence of manufacturing processes and genetic engineering advancements, focusing on the development, production, and application of genetically engineered products. Students will gain deep insights into techniques used to enhance manufacturing processes in biotechnology and genetic engineering fields.

15.2.Introduction to Genetic Engineering

Provides a foundational understanding of genetic engineering principles, techniques, and its application in various fields including biotechnology.

15.3..Manufacturing Processes in Biotechnology

Covers traditional and innovative manufacturing processes used in biotechnology, essential for producing genetically modified organisms and compounds.

15.4..CRISPR and Advanced Genetic Modification Techniques

An in-depth look at cutting-edge genetic modification techniques such as CRISPR, which are revolutionizing genetic engineering and manufacturing.

15.5.Ethical and Regulatory Considerations

Discusses the ethical dilemmas and regulatory framework governing genetic engineering and manufacturing processes.

15.6.Biopharmaceutical Manufacturing

Explores the manufacturing techniques specific to biopharmaceuticals produced through genetic engineering.

15.7.Fermentation Technology

Focuses on fermentation processes used in manufacturing biologically engineered products.

15.8..Scale-Up and Commercialization

Discusses the challenges and strategies involved in scaling genetic engineering products from laboratory to market.

15.9.Quality Control in Genetically Engineered Products

Examines the quality control methodologies specific to genetic engineering industries.

15.10.Future Trends in Genetic Engineering Manufacturing

Looks ahead at emerging trends and technologies that are poised to influence the genetic engineering and manufacturing landscape.

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Explores the manufacturing techniques specific to biopharmaceuticals produced through genetic engineering.

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Focuses on fermentation processes used in manufacturing biologically engineered products.

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Discusses the challenges and strategies involved in scaling genetic engineering products from laboratory to market.

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Examines the quality control methodologies specific to genetic engineering industries.

15.10.Future Trends in Genetic Engineering Manufacturing

Looks ahead at emerging trends and technologies that are poised to influence the genetic engineering and manufacturing landscape.

16.topics

4.1 .12.15.16.1.Data Processing and Hosting Services in Computer Engineering

This course is designed for graduate students pursuing a Master's degree in Computer Engineering with a focus on data processing and hosting services. It explores the advanced concepts, methodologies, and applications in managing and processing vast amounts of data, and the technological infrastructure in hosting services necessary to support such activities.

16.2.Introduction to Data Processing

An overview of data processing concepts including data collection, cleaning, transformation, and storage.

16.3.Cloud Hosting Services

Understanding cloud hosting fundamentals including types of cloud services, deployment models, and scalability.

16.4..Big Data Technologies

Exploring the tools and technologies used for processing and managing big data such as Hadoop and Spark.

16.5Data Security in Cloud Hosting

An in-depth look into data security practices in cloud hosting environments, including encryption and access management.

16.6.Containerization and Microservices

Understanding containerization technologies like Docker and Kubernetes and their role in hosting services.

16.7Distributed Systems

Study of distributed computing systems architecture, design, and management.

16.8.Data Warehousing and Analytics

Techniques and tools used to design data warehouses and leverage analytics for business intelligence.

16.9..Serverless Computing

Exploration of serverless computing models and their application in data hosting services.

4.1 .12.15..16.1 Data Processing and Hosting Services in Computer Engineering

This course is designed for graduate students pursuing a Master's degree in Computer Engineering with a focus on data processing and hosting services. It explores the advanced concepts, methodologies, and applications in managing and processing vast amounts of data, and the technological infrastructure in hosting services necessary to support such activities.

16.2 Introduction to Data Processing

An overview of data processing concepts including data collection, cleaning, transformation, and storage.

Key Topics:

- **Data Collection:** Methods and tools for gathering data from various sources.
- **Data Cleaning:** Techniques for identifying and correcting errors in data sets.
- **Data Transformation:** Processes for converting data into a usable format.
- **Data Storage:** Solutions for storing large volumes of data efficiently.

16.3 Cloud Hosting Services

Understanding cloud hosting fundamentals including types of cloud services, deployment models, and scalability.

Key Topics:

- **Types of Cloud Services:** Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS).
- **Deployment Models:** Public cloud, private cloud, and hybrid cloud.
- **Scalability:** Techniques for scaling cloud resources to meet demand.

16.4 Big Data Technologies

Exploring the tools and technologies used for processing and managing big data such as Hadoop and Spark.

Key Topics:

- **Hadoop:** Overview of the Hadoop ecosystem and its components.
- **Spark:** Understanding Apache Spark and its use in big data processing.
- **Big Data Frameworks:** Comparing different frameworks and their applications.

16.5 Data Security in Cloud Hosting

An in-depth look into data security practices in cloud hosting environments, including encryption and access management.

Key Topics:

- **Encryption:** Techniques for encrypting data at rest and in transit.
- **Access Management:** Strategies for managing user access and permissions.
- **Security Protocols:** Implementing security protocols to protect data in the cloud.

16.6 Containerization and Microservices

Understanding containerization technologies like Docker and Kubernetes and their role in hosting services.

Key Topics:

- **Docker:** Basics of Docker and containerization.

- **Kubernetes:** Orchestration of containerized applications using Kubernetes.
- **Microservices Architecture:** Designing applications using microservices for scalability and flexibility.

16.7 Distributed Systems

Study of distributed computing systems architecture, design, and management.

Key Topics:

- **Distributed Computing:** Principles and challenges of distributed systems.
- **System Architecture:** Designing and managing distributed system architectures.
- **Consistency and Fault Tolerance:** Ensuring consistency and reliability in distributed environments.

16.8 Data Warehousing and Analytics

Techniques and tools used to design data warehouses and leverage analytics for business intelligence.

Key Topics:

- **Data Warehousing:** Design and implementation of data warehouses.
- **ETL Processes:** Extract, Transform, Load processes for data warehousing.
- **Business Intelligence:** Leveraging analytics for decision-making and insights.

16.9 Serverless Computing

Exploration of serverless computing models and their application in data hosting services.

Key Topics:

- **Serverless Models:** Understanding Function as a Service (FaaS) and Backend as a Service (BaaS).
- **Benefits of Serverless:** Scalability, cost-efficiency, and simplified management.
- **Use Cases:** Real-world applications of serverless computing.

These topics provide a comprehensive understanding of data processing and hosting services in computer engineering, equipping students with the knowledge and skills to manage and process vast amounts of data effectively.

If you have any specific questions or need more details on a

17.topics

4.1 .12.15..17.1.Masters in Cryptocurrency and Blockchain Applications

This course provides an in-depth exploration of blockchain technology and digital currency. Students will learn about the foundational principles of the blockchain, the development and application of cryptocurrencies, and various real-world applications. Emphasis will be placed on developing a practical understanding of blockchain software, digital currency markets, and smart contracts.

17.2.Introduction to Blockchain Technology

Learn the fundamentals of blockchain technology, including its history, key concepts, and how it differs from traditional databases.

17.2.Cryptocurrencies: An Overview

Understand the various types of cryptocurrencies, their functions, and the economics underlying digital currencies.

17.3.Blockchain Consensus Mechanisms

Explore how consensus mechanisms like Proof of Work, Proof of Stake, and others operate within blockchain networks.

17.4..Smart Contracts

Learn about smart contracts, their capabilities, use cases, and limitations. Understand how they are deployed and managed on blockchain networks.

17.5.Decentralized Finance (DeFi)

Explore the growth of DeFi platforms and how they are revolutionizing traditional financial systems.

17.6.Blockchain in Supply Chain Management

Understand how blockchain technology is applied in supply chain management to enhance transparency and efficiency.

17.7.Regulation and Compliance in Blockchain

Study the regulatory landscape surrounding blockchain technology and cryptocurrencies, including the challenges and opportunities involved.

17.8.NFTs and Digital Assets

Explore the world of Non-Fungible Tokens (NFTs), their creation, market dynamics, and how they impact digital ownership and media.

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17.1 Masters in Cryptocurrency and Blockchain Applications

This course provides an in-depth exploration of blockchain technology and digital currency. Students will learn about the foundational principles of the blockchain, the development and application of cryptocurrencies, and various real-world applications. Emphasis will be placed on developing a practical understanding of blockchain software, digital currency markets, and smart contracts.

17.2 Introduction to Blockchain Technology

Learn the fundamentals of blockchain technology, including its history, key concepts, and how it differs from traditional databases.

Key Topics:

- **History of Blockchain:** Tracing the origins and evolution of blockchain technology.
- **Key Concepts:** Understanding blocks, chains, nodes, and consensus mechanisms.
- **Differences from Traditional Databases:** Comparing blockchain to centralized databases in terms of structure, security, and transparency.

17.3 Cryptocurrencies: An Overview

Understand the various types of cryptocurrencies, their functions, and the economics underlying digital currencies.

Key Topics:

- **Types of Cryptocurrencies:** Bitcoin, Ethereum, altcoins, and stablecoins.
- **Functions of Cryptocurrencies:** Medium of exchange, store of value, and investment asset.
- **Economics of Digital Currencies:** Supply, demand, market capitalization, and price volatility.

17.4 Blockchain Consensus Mechanisms

Explore how consensus mechanisms like Proof of Work, Proof of Stake, and others operate within blockchain networks.

Key Topics:

- **Proof of Work (PoW):** Understanding the mining process, energy consumption, and security.
- **Proof of Stake (PoS):** Staking, validators, and energy efficiency.
- **Alternative Consensus Mechanisms:** Delegated Proof of Stake (DPoS), Practical Byzantine Fault Tolerance (PBFT), and more.

17.5 Smart Contracts

Learn about smart contracts, their capabilities, use cases, and limitations. Understand how they are deployed and managed on blockchain networks.

Key Topics:

- **Definition and Functionality:** What smart contracts are and how they work.
- **Use Cases:** Applications in finance, supply chain, real estate, and other industries.
- **Limitations:** Challenges such as scalability, security vulnerabilities, and legal considerations.

17.6 Decentralized Finance (DeFi)

Explore the growth of DeFi platforms and how they are revolutionizing traditional financial systems.

Key Topics:

- **Overview of DeFi:** Understanding the principles and goals of decentralized finance.
- **DeFi Platforms:** Popular platforms like Uniswap, Aave, and Compound.
- **Impact on Traditional Finance:** How DeFi is transforming lending, borrowing, trading, and asset management.

17.7 Blockchain in Supply Chain Management

Understand how blockchain technology is applied in supply chain management to enhance transparency and efficiency.

Key Topics:

- **Transparency and Traceability:** How blockchain improves visibility and tracking in supply chains.
- **Efficiency Improvements:** Reducing fraud, errors, and delays in supply chain processes.
- **Case Studies:** Real-world examples of blockchain applications in supply chain management.

17.8 Regulation and Compliance in Blockchain

Study the regulatory landscape surrounding blockchain technology and cryptocurrencies, including the challenges and opportunities involved.

Key Topics:

- **Regulatory Frameworks:** Understanding the legal regulations governing blockchain and cryptocurrencies.
- **Compliance Requirements:** Ensuring compliance with anti-money laundering (AML) and know your customer (KYC) regulations.
- **Challenges and Opportunities:** Navigating the evolving regulatory environment and its impact on the blockchain industry.

17.9 NFTs and Digital Assets

Explore the world of Non-Fungible Tokens (NFTs), their creation, market dynamics, and how they impact digital ownership and media.

Key Topics:

- **Introduction to NFTs:** Understanding what NFTs are and how they work.
- **Market Dynamics:** Trends, marketplaces, and the economic aspects of NFTs.
- **Impact on Digital Ownership:** How NFTs are changing the landscape of digital art, collectibles, and intellectual property.

These topics provide a comprehensive understanding of cryptocurrency and blockchain applications, equipping students with the knowledge and skills to innovate and lead in this rapidly evolving field.

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18 topic

4.1 .12.15.18.1.Advanced Cybersecurity in Bibliotechnology

This course explores the intersection of cybersecurity and bibliotechnology, focusing on protecting digital library systems, data privacy, and integrity in library networks. Students will learn about cybersecurity principles and practices specifically tailored for bibliotechnology, ensuring the safety and security of digital libraries and bibliographic databases.

18.2.Introduction to Cybersecurity in Bibliotechnology

An overview of the basic principles of cybersecurity and their importance in the domain of bibliotechnology.

18.3Threats and Vulnerabilities in Digital Libraries

Understanding the common cybersecurity threats and vulnerabilities unique to digital

18.4.Data Privacy and Integrity in Bibliotechnology

Exploring techniques to ensure data privacy and maintain data integrity for library users and their digital interactions.

18.5.Implementing Security Policies for Digital Libraries

Developing and applying security policies and frameworks tailored for digital libraries to safeguard information assets.

18.6.Access Control in Library Networks

Examining access control mechanisms to secure user authentication and authorization within library systems.

18.7.Digital Rights Management in Bibliotechnology

Understanding digital rights management and its role in protecting digital content in bibliotechnology.

18.8.Network Security Essentials for Digital Libraries

Learn the essentials of securing library networks, combating network-based threats, and implementing robust network security measures.

18.9.Incident Response and Recovery for Digital Libraries

Strategies for effectively responding to and recovering from cybersecurity incidents within digital library environments.

18..10Emerging Cybersecurity Technologies in Bibliotechnology

Explore the role of emerging technologies like AI and blockchain in enhancing cybersecurity in bibliotechnology.

4.1 .12.15.18.1 Advanced Cybersecurity in Bibliotechnology

This course explores the intersection of cybersecurity and bibliotechnology, focusing on protecting digital library systems, data privacy, and integrity in library networks. Students will learn about cybersecurity principles and practices specifically tailored for bibliotechnology, ensuring the safety and security of digital libraries and bibliographic databases.

18.2 Introduction to Cybersecurity in Bibliotechnology

An overview of the basic principles of cybersecurity and their importance in the domain of bibliotechnology.

Key Topics:

- **Cybersecurity Principles:** Basic concepts of cybersecurity such as confidentiality, integrity, and availability.
- **Importance in Bibliotechnology:** Understanding why cybersecurity is crucial for digital libraries and bibliographic databases.
- **Common Cyber Threats:** Identifying typical cyber threats that can affect bibliotechnological systems.

18.3 Threats and Vulnerabilities in Digital Libraries

Understanding the common cybersecurity threats and vulnerabilities unique to digital libraries.

Key Topics:

- **Threat Landscape:** Overview of threats such as malware, phishing, and ransomware.
- **Vulnerabilities:** Identifying and assessing vulnerabilities specific to digital library systems.
- **Risk Assessment:** Techniques for evaluating and mitigating risks in digital libraries.

18.4 Data Privacy and Integrity in Bibliotechnology

Exploring techniques to ensure data privacy and maintain data integrity for library users and their digital interactions.

Key Topics:

- **Data Privacy Techniques:** Implementing privacy measures such as anonymization and encryption.
- **Data Integrity:** Ensuring that data remains accurate and unaltered through checksums and hashes.
- **User Data Protection:** Protecting sensitive information related to library users.

18.5 Implementing Security Policies for Digital Libraries

Developing and applying security policies and frameworks tailored for digital libraries to safeguard information assets.

Key Topics:

- **Policy Development:** Crafting comprehensive security policies for digital libraries.
- **Frameworks:** Utilizing existing security frameworks like ISO/IEC 27001.
- **Policy Enforcement:** Strategies for enforcing and maintaining security policies.

18.6 Access Control in Library Networks

Examining access control mechanisms to secure user authentication and authorization within library systems.

Key Topics:

- **Authentication Methods:** Techniques such as passwords, biometrics, and multi-factor authentication.
- **Authorization:** Ensuring proper access controls and role-based access within library networks.
- **Access Management Tools:** Using tools and software to manage access controls effectively.

18.7 Digital Rights Management in Bibliotechnology

Understanding digital rights management (DRM) and its role in protecting digital content in bibliotechnology.

Key Topics:

- **DRM Principles:** Basic concepts and purposes of DRM.
- **DRM Technologies:** Tools and technologies used for implementing DRM in digital libraries.
- **Content Protection:** Strategies for protecting digital content from unauthorized access and distribution.

18.8 Network Security Essentials for Digital Libraries

Learn the essentials of securing library networks, combating network-based threats, and implementing robust network security measures.

Key Topics:

- **Network Security Fundamentals:** Understanding firewalls, intrusion detection/prevention systems, and VPNs.
- **Network Threats:** Identifying and mitigating threats such as DDoS attacks and man-in-the-middle attacks.
- **Security Measures:** Best practices for securing network infrastructure in digital libraries.

18.9 Incident Response and Recovery for Digital Libraries

Strategies for effectively responding to and recovering from cybersecurity incidents within digital library environments.

Key Topics:

- **Incident Response Planning:** Developing and implementing incident response plans.
- **Recovery Techniques:** Strategies for recovering data and services after a cybersecurity incident.
- **Post-Incident Analysis:** Conducting root cause analysis and improving security measures.

18.10 Emerging Cybersecurity Technologies in Bibliotechnology

Explore the role of emerging technologies like AI and other advanced tools in enhancing cybersecurity in bibliotechnology.

Key Topics:

- **AI in Cybersecurity:** Utilizing artificial intelligence for threat detection and response.
- **Blockchain Technology:** Applying blockchain for secure and transparent data management.
- **Future Trends:** Exploring future trends and advancements in cybersecurity technologies.

These courses provide a comprehensive understanding of advanced cybersecurity principles and practices in the context of bibliotechnology, preparing students to protect digital libraries and bibliographic databases effectively

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19 topics

4.1 .12.15..19.1.1Edge Computing in Modern Power and Energy Systems

This course provides an in-depth exploration of edge computing technologies and their integration into modern power and energy systems. Students will learn about the principles of edge computing and how it can optimize energy distribution, improve grid reliability, and enhance energy management. The course covers various topics such as distributed computing, real-time data processing, IoT in energy systems, and security challenges.

19.2..Introduction to Edge Computing

An overview of edge computing and its significance in the modern power and energy sectors. It covers the basics of edge nodes, latency reduction, and system efficiency.

19.3.Distributed Computing in Energy Systems

Explores how distributed computing operates in energy systems to enhance performance, reliability, and efficiency.

19.4.IoT Applications in Power Systems

Discusses the role of IoT devices in modern power systems for data collection, analysis, and decision-making.

19.5.Real-time Data Processing

Focuses on techniques for real-time data processing at the edge, including algorithms and architectures suited for energy systems.

19.6Security and Privacy in Edge Computing

Examines the security challenges in edge computing environments and how they impact energy systems, with strategies for mitigation.

19.6.Edge Analytics for Energy Management

Investigates the use of edge analytics for optimizing energy management through predictive analytics and machine learning.

19.7.Energy Efficiency Optimization

Covers strategies for improving energy efficiency through edge computing technologies and smart grids.

19.8.Case Studies on Edge Computing in Energy

Presents real-world case studies to illustrate the deployment and impact of edge computing in energy systems.

19.9.Future Trends in Edge Computing for Energy Systems

Explores future developments and potential advancements in edge computing applicable to power and energy systems.

19.1 Edge Computing in Modern Power and Energy Systems

This course provides an in-depth exploration of edge computing technologies and their integration into modern power and energy systems. Students will learn about the principles of edge computing and how it can optimize energy distribution, improve grid reliability, and enhance energy management. The course covers various topics such as distributed

computing, real-time data processing, IoT in energy systems, and security challenges.

19.2 Introduction to Edge Computing

An overview of edge computing and its significance in the modern power and energy sectors. It covers the basics of edge nodes, latency reduction, and system efficiency.

Key Topics:

- **Edge Nodes:** Understanding the role of edge nodes in data processing.
- **Latency Reduction:** Techniques to reduce latency and improve response times.
- **System Efficiency:** Enhancing overall system efficiency through edge computing.

19.3 Distributed Computing in Energy Systems

Explores how distributed computing operates in energy systems to enhance performance, reliability, and efficiency.

Key Topics:

- **Distributed Computing Principles:** Basics of distributed computing and its application in energy systems.
- **Performance Enhancement:** Improving system performance through distributed computing.
- **Reliability and Efficiency:** Ensuring system reliability and operational efficiency.

19.4 IoT Applications in Power Systems

Discusses the role of IoT devices in modern power systems for data collection, analysis, and decision-making.

Key Topics:

- **IoT Devices:** Types and functions of IoT devices in power systems.

- **Data Collection and Analysis:** Leveraging IoT for real-time data collection and analysis.
- **Decision-Making:** Enhancing decision-making processes using IoT data.

19.5 Real-time Data Processing

Focuses on techniques for real-time data processing at the edge, including algorithms and architectures suited for energy systems.

Key Topics:

- **Real-time Processing Techniques:** Algorithms and architectures for real-time data processing.
- **Edge Processing:** Advantages and challenges of processing data at the edge.
- **Application in Energy Systems:** Implementing real-time data processing in energy management.

19.6 Security and Privacy in Edge Computing

Examines the security challenges in edge computing environments and how they impact energy systems, with strategies for mitigation.

Key Topics:

- **Security Challenges:** Identifying security threats in edge computing environments.
- **Privacy Concerns:** Ensuring data privacy in distributed systems.
- **Mitigation Strategies:** Techniques for mitigating security and privacy risks.

19.7 Edge Analytics for Energy Management

Investigates the use of edge analytics for optimizing energy management through predictive analytics and machine learning.

Key Topics:

- **Edge Analytics:** Understanding edge analytics and its benefits.

- **Predictive Analytics:** Using predictive analytics for proactive energy management.
- **Machine Learning:** Applying machine learning models to enhance energy efficiency.

19.8 Energy Efficiency Optimization

Covers strategies for improving energy efficiency through edge computing technologies and smart grids.

Key Topics:

- **Energy Optimization Techniques:** Methods for optimizing energy use.
- **Smart Grids:** Role of smart grids in energy efficiency.
- **Integration with Edge Computing:** How edge computing enhances energy optimization efforts.

19.9 Case Studies on Edge Computing in Energy

Presents real-world case studies to illustrate the deployment and impact of edge computing in energy systems.

Key Topics:

- **Case Studies:** Examples of successful edge computing implementations.
- **Deployment Challenges:** Overcoming challenges in deploying edge computing solutions.
- **Impact Assessment:** Evaluating the impact of edge computing on energy management.

19.10 Future Trends in Edge Computing for Energy Systems

Explores future developments and potential advancements in edge computing applicable to power and energy systems.

Key Topics:

- **Emerging Technologies:** Future technologies that could shape edge computing.
- **Trends in Energy Systems:** Anticipating trends and advancements in energy management.
- **Research and Development:** Ongoing and future research initiatives in edge computing.

These courses provide a comprehensive understanding of edge computing in modern power and energy systems, equipping students with the knowledge and skills to optimize energy distribution, improve grid reliability, and enhance energy management.

If you have any specific questions or need more details on any of these topics, feel free to ask!

Edge Computing for Modern Power and Energy Systems

This advanced course explores the role and integration of edge computing technologies in modern power and energy systems. The syllabus covers fundamental concepts, applications, and the impact of edge computing in enhancing efficiency, reliability, and sustainability in energy systems. Students will learn through theoretical insights and practical applications, supplemented by interactive resources.

Introduction to Edge Computing

Understanding the basic concepts and architecture of edge computing, its significance in reducing latency and improving real-time processing capabilities in power systems.

Role of Edge Computing in Smart Grids

Exploring how edge computing supports smart grid operations including demand response, grid stability, and energy distribution management.

Edge Computing for Renewable Energy Integration

Analyzing the integration of renewable energy sources into power grids using edge computing to enhance efficiency and sustainability.

Data Management and Security in Edge Computing

Understanding how data is managed and secured in edge computing systems, with a focus on the challenges and solutions in power systems.

Machine Learning Applications on the Edge

Investigating the applications of machine learning in edge devices to predict and optimize energy consumption and distribution.

Case Studies in Edge Computing for Energy Systems

Reviewing real-world case studies to understand the implementation and outcomes of edge computing in energy systems.

Challenges and Future Trends

Discussing the current challenges faced by edge computing in energy systems and predicting future trends and technological advancements.

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20 topics

4.1 .12.15..20.1.Masters in Cyber-Physical Systems and Information Technology

This course provides an in-depth understanding of Cyber-Physical Systems (CPS) within the realm of Information Technology. By exploring the convergence of physical and cyber domains, students will gain insights into the integration, design, and application of CPS in various sectors. Through a combination of theoretical studies and practical assignments, this course aims to equip students with the skills necessary to innovate in this rapidly evolving field.

20.2.Introduction to Cyber-Physical Systems

This topic covers the basics of CPS, including definitions, history, and key concepts that distinguish CPS from traditional IT systems.

20.3.Architecture of CPS

Explore the architecture of CPS, focusing on sensors, actuators, control systems, and the role of internet of things (IoT) in CPS.

20.4Networking and Communication in CPS

Understand the communication protocols and networks that enable interaction between cyber and physical components within CPS.

20.5.CPS Security and Privacy

This topic delves into the security challenges in CPS and discusses methods to ensure data integrity and privacy.

20.6.Machine Learning in CPS

Examine the role of machine learning in optimizing the performance and decision-making processes within CPS.

20.7.Real-Time Systems and CPS

Learn about the real-time requirements of CPS and the design considerations necessary to meet these requirements.

20.8.Simulation and Modeling in CPS

Explore tools and methodologies for simulating and modeling CPS to optimize design and operation.

20.9..Applications and Case Studies of CPS

Analyze various applications of CPS in industries like healthcare, automotive, and smart grids with real-world case studies.

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20.1 Masters in Cyber-Physical Systems and Information Technology

This course provides an in-depth understanding of Cyber-Physical Systems (CPS) within the realm of Information Technology. By exploring the convergence of physical and cyber domains, students will gain insights into the integration, design, and application of CPS in various sectors. Through a combination of theoretical studies and practical assignments, this course aims to equip students with the skills necessary to innovate in this rapidly evolving field.

20.2 Introduction to Cyber-Physical Systems

This topic covers the basics of CPS, including definitions, history, and key concepts that distinguish CPS from traditional IT systems.

Key Topics:

- **Definitions:** Understanding what CPS are and how they operate.
- **History:** Tracing the development and evolution of CPS.
- **Key Concepts:** Exploring the unique attributes of CPS, such as real-time computing and system integration.

20.3 Architecture of CPS

Explore the architecture of CPS, focusing on sensors, actuators, control systems, and the role of the Internet of Things (IoT) in CPS.

Key Topics:

- **Sensors and Actuators:** Understanding their roles and how they interact within CPS.
- **Control Systems:** Examining the mechanisms that manage and control physical processes.
- **IoT Integration:** The role of IoT in enhancing CPS functionality and connectivity.

20.4 Networking and Communication in CPS

Understand the communication protocols and networks that enable interaction between cyber and physical components within CPS.

Key Topics:

- **Communication Protocols:** Exploring various protocols used in CPS for data transmission.
- **Network Architecture:** Designing and managing networks to support CPS operations.
- **Data Exchange:** Ensuring efficient and secure data exchange between components.

20.5 CPS Security and Privacy

This topic delves into the security challenges in CPS and discusses methods to ensure data integrity and privacy.

Key Topics:

- **Security Challenges:** Identifying and addressing vulnerabilities in CPS.
- **Data Integrity:** Techniques for ensuring the accuracy and reliability of data.
- **Privacy Measures:** Protecting sensitive information within CPS environments.

20.6 Machine Learning in CPS

Examine the role of machine learning in optimizing the performance and decision-making processes within CPS.

Key Topics:

- **Machine Learning Algorithms:** Applying algorithms to enhance CPS functionality.
- **Optimization:** Using machine learning for predictive maintenance and performance improvement.
- **Decision-Making:** Enhancing automated decision-making processes in CPS.

20.7 Real-Time Systems and CPS

Learn about the real-time requirements of CPS and the design considerations necessary to meet these requirements.

Key Topics:

- **Real-Time Computing:** Understanding the principles of real-time systems.
- **Design Considerations:** Ensuring CPS can meet strict timing constraints.
- **Application Scenarios:** Real-world examples of real-time CPS applications.

20.8 Simulation and Modeling in CPS

Explore tools and methodologies for simulating and modeling CPS to optimize design and operation.

Key Topics:

- **Simulation Tools:** Overview of tools used for CPS simulation.
- **Modeling Techniques:** Creating accurate models of CPS for analysis and optimization.
- **Design Optimization:** Using simulations to improve CPS design and performance.

20.9 Applications and Case Studies of CPS

Analyze various applications of CPS in industries like healthcare, automotive, and smart grids with real-world case studies.

Key Topics:

- **Industry Applications:** Exploring how CPS are applied in different sectors.
- **Case Studies:** Reviewing successful implementations and their outcomes.
- **Lessons Learned:** Understanding the challenges and solutions in real-world CPS projects.

These courses provide a comprehensive understanding of Cyber-Physical Systems and their integration within Information Technology, equipping students with the skills to innovate and lead in this rapidly evolving field.

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21 topics

4.1 .12.15.21.1.Masters in Distributed-Ledger Technology Applications in Educational Technology

This course explores the integration of distributed ledger technologies (DLT), such as blockchain, into educational technology platforms. Students will learn about DLT concepts, their applications in the management and dissemination of educational content, secure credentialing, and enhancing educational efficiencies. The course equips students with both theoretical

understanding and practical skills to innovate within the educational sector using advanced DLT methodologies.

21.1. Introduction to Distributed Ledger Technology

An overview of distributed ledger technology including blockchain, its history, and basic principles that empower decentralized systems.

21.2.The Need for Distributed Ledger Technology in Education

Examine the challenges in the current educational systems and how DLT can address issues around data security, integrity, and cost-efficiency.

21.3.Blockchain for Secure Credentialing

Explore how blockchain can be used for secure credentialing, providing reliable storage and easy verification of educational credentials.

21.4.Smart Contracts in Educational Transactions

Learn about smart contracts and how they can optimize and automate payment systems, enrollments, and certifications in education.

21.5..DLT-based Learning Management Systems

Investigate the potential of DLT to revolutionize Learning Management Systems (LMS) by enabling decentralized data management and analytics.

Privacy and Data Security in DLT

Understand the privacy considerations and security protocols of DLT systems and how data privacy is enhanced within educational contexts.

21.6.Case Studies of DLT in Education

Review real-world implementations of DLT in education and analyze the outcomes and lessons learned from these case studies.

21.7.Future Trends in DLT and EdTech

Delve into the emerging trends and future directions of DLT applications in educational technology.

21.1 Masters in Distributed-Ledger Technology Applications in Educational Technology

This course explores the integration of distributed ledger technologies (DLT), such as blockchain, into educational technology platforms. Students will learn about DLT concepts, their applications in the management and dissemination of educational content, secure credentialing, and enhancing educational efficiencies. The course equips students with both theoretical understanding and practical skills to innovate within the educational sector using advanced DLT methodologies.

21.2 Introduction to Distributed Ledger Technology

An overview of distributed ledger technology including blockchain, its history, and basic principles that empower decentralized systems.

Key Topics:

- **History of DLT:** Understanding the origins and evolution of distributed ledger technology.
- **Basic Principles:** Exploring the core principles of decentralization, transparency, and immutability.
- **Blockchain Technology:** Introduction to blockchain and how it functions as a distributed ledger.

21.3 The Need for Distributed Ledger Technology in Education

Examine the challenges in the current educational systems and how DLT can address issues around data security, integrity, and cost-efficiency.

Key Topics:

- **Current Challenges:** Identifying problems such as data breaches, fraud, and inefficiencies.
- **DLT Solutions:** How distributed ledger technology can enhance data security, ensure data integrity, and reduce costs.
- **Case Examples:** Real-world scenarios where DLT has been implemented in education.

21.4 Blockchain for Secure Credentialing

Explore how blockchain can be used for secure credentialing, providing reliable storage and easy verification of educational credentials.

Key Topics:

- **Credentialing Issues:** Understanding the issues with traditional credentialing methods.
- **Blockchain Solutions:** How blockchain ensures secure and tamper-proof credentialing.
- **Verification:** The process of verifying educational credentials using blockchain.

21.5 Smart Contracts in Educational Transactions

Learn about smart contracts and how they can optimize and automate payment systems, enrollments, and certifications in education.

Key Topics:

- **Smart Contracts:** Understanding what smart contracts are and how they work.
- **Applications in Education:** Using smart contracts for automating payments, enrollments, and certifications.
- **Benefits and Challenges:** Exploring the advantages and potential challenges of implementing smart contracts in education.

21.6 DLT-based Learning Management Systems

Investigate the potential of DLT to revolutionize Learning Management Systems (LMS) by enabling decentralized data management and analytics.

Key Topics:

- **DLT Integration:** How distributed ledger technology can be integrated into LMS.
- **Decentralized Data Management:** Benefits of decentralized data management for educational institutions.
- **Analytics:** Leveraging DLT for enhanced data analytics and insights.

21.7 Privacy and Data Security in DLT

Understand the privacy considerations and security protocols of DLT systems and how data privacy is enhanced within educational contexts.

Key Topics:

- **Privacy Protocols:** Implementing privacy protocols in DLT systems.
- **Data Security:** Ensuring the security of data stored and managed on distributed ledgers.
- **Educational Contexts:** Specific considerations for enhancing data privacy in educational environments.

21.8 Case Studies of DLT in Education

Review real-world implementations of DLT in education and analyze the outcomes and lessons learned from these case studies.

Key Topics:

- **Case Studies:** Detailed analysis of successful DLT implementations in educational settings.
- **Outcomes:** Understanding the impact of DLT on educational processes.
- **Lessons Learned:** Key takeaways and best practices from real-world examples.

21.9 Future Trends in DLT and EdTech

Delve into the emerging trends and future directions of DLT applications in educational technology.

Key Topics:

- **Emerging Trends:** Identifying new and upcoming trends in DLT and EdTech.
- **Future Directions:** Exploring potential future developments in DLT applications for education.

- **Research and Innovation:** Current and future research initiatives in the field of DLT and educational technology.

These courses provide a comprehensive understanding of distributed ledger technology applications in educational technology, equipping students with the knowledge and skills to innovate and lead in this rapidly evolving field.

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22 topics

4.1 .12.15.22.1.Master's in Adult Education Services

This course is designed for educators and professionals aspiring to excel in the field of adult education. It focuses on teaching strategies, curriculum design, assessment methods, and the unique needs and challenges faced by adult learners. The course aims to prepare students to effectively design and implement educational programs that cater to adult learners in various settings.

22.1.Introduction to Adult Education

An overview of the principles and practices in adult education, including historical perspectives and modern developments.

22.2.Theories of Adult Learning

Exploration of key theories such as Andragogy, Transformative Learning, and Experiential Learning that inform adult education practices.

22.3.Curriculum Design for Adult Learners

Techniques and strategies for developing effective curricula tailored to adult learners' needs and goals.

22.4.Assessment and Evaluation in Adult Education

Methods for assessing adult learners' progress and program effectiveness, including formative and summative evaluation.

22.5.Technology Integration in Adult Learning

Utilizing digital tools and technologies to enhance adult learning experiences.

22.6.Diversity and Inclusion in Adult Education

Addressing the diverse backgrounds, identities, and learning styles of adult learners.

22.7.Motivational Strategies for Adult Learners

Strategies to engage and motivate adult learners, fostering a positive and productive learning environment.

22.8.Professional Development for Adult Educators

Resources and strategies for ongoing professional growth and development in adult education.-

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22.1 Master's in Adult Education Services

This course is designed for educators and professionals aspiring to excel in the field of adult education. It focuses on teaching strategies, curriculum design, assessment methods, and the unique needs and challenges faced by adult learners. The course aims to prepare students to effectively design and implement educational programs that cater to adult learners in various settings.

22.2 Introduction to Adult Education

An overview of the principles and practices in adult education, including historical perspectives and modern developments.

Key Topics:

- **Principles of Adult Education:** Understanding the foundational principles guiding adult education.
- **Historical Perspectives:** Tracing the evolution of adult education practices.
- **Modern Developments:** Exploring recent advancements and trends in adult education.

22.3 Theories of Adult Learning

Exploration of key theories such as Andragogy, Transformative Learning, and Experiential Learning that inform adult education practices.

Key Topics:

- **Andragogy:** Principles of adult learning introduced by Malcolm Knowles.
- **Transformative Learning:** How transformative experiences foster deep learning in adults.
- **Experiential Learning:** The role of hands-on experiences and reflection in adult learning.

22.4 Curriculum Design for Adult Learners

Techniques and strategies for developing effective curricula tailored to adult learners' needs and goals.

Key Topics:

- **Needs Assessment:** Identifying the learning needs of adult learners.
- **Curriculum Planning:** Creating structured and flexible curricula that accommodate adult learners.
- **Instructional Strategies:** Implementing various teaching methods to enhance learning.

22.5 Assessment and Evaluation in Adult Education

Methods for assessing adult learners' progress and program effectiveness, including formative and summative evaluation.

Key Topics:

- **Formative Assessment:** Techniques for ongoing assessment to support learning.
- **Summative Evaluation:** Evaluating learner outcomes at the end of a program.
- **Program Effectiveness:** Measuring the success and impact of adult education programs.

22.6 Technology Integration in Adult Learning

Utilizing digital tools and technologies to enhance adult learning experiences.

Key Topics:

- **E-Learning Platforms:** Using online platforms to deliver educational content.
- **Blended Learning:** Combining face-to-face and online learning methods.
- **Tech Tools:** Incorporating various digital tools to support teaching and learning.

22.7 Diversity and Inclusion in Adult Education

Addressing the diverse backgrounds, identities, and learning styles of adult learners.

Key Topics:

- **Cultural Competence:** Understanding and respecting cultural differences in the classroom.
- **Inclusive Practices:** Implementing strategies to create inclusive learning environments.
- **Learning Styles:** Adapting teaching methods to accommodate different learning styles.

22.8 Motivational Strategies for Adult Learners

Strategies to engage and motivate adult learners, fostering a positive and productive learning environment.

Key Topics:

- **Motivational Theories:** Exploring theories that explain adult learner motivation.
- **Engagement Techniques:** Practical strategies to keep adult learners engaged.

- **Supportive Environment:** Creating a learning environment that encourages persistence and success.

22.9 Professional Development for Adult Educators

Resources and strategies for ongoing professional growth and development in adult education.

Key Topics:

- **Continuing Education:** Opportunities for adult educators to enhance their skills and knowledge.
- **Professional Networks:** Building and leveraging networks for support and growth.
- **Reflective Practice:** Encouraging self-reflection to improve teaching practices.

These courses provide a comprehensive understanding of adult education services, equipping educators with the knowledge and skills to effectively design and implement programs tailored to adult learners.

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23 topics

4.1 .12.15.23.1Quantum Computing in Systems Engineering

This course provides an in-depth exploration of quantum computing principles and their applications within the field of systems engineering. Students will gain a comprehensive understanding of both theoretical foundations and practical implementations of quantum technologies in designing and optimizing complex systems.

23.1.Introduction to Quantum Computing

An overview of the principles of quantum mechanics that form the basis of quantum computing technology, including qubits, superposition, and entanglement.

23.2.Quantum Algorithms

Detailed study of key quantum algorithms such as Shor's algorithm and Grover's algorithm, and their implications for solving complex computational problems.

22.3.Quantum Gates and Circuits

Exploration of fundamental quantum gates and the construction of quantum circuits to perform computational tasks using qubits.

22.4.Quantum Information Theory

Understanding the theoretical underpinnings of how quantum mechanics enhances information processing capabilities in systems engineering.

22.5.Quantum Computing Platforms

Introduction to current quantum computing platforms and hardware, including superconducting qubits and trapped ions.

22.6.Quantum Programming Languages

Learning and applying quantum programming languages such as Qiskit, Cirq, and Q# to develop quantum algorithms.

22.7.Applications of Quantum Computing in Systems Engineering

Investigation of potential applications of quantum computing in systems engineering, including optimization, simulation, and cryptography.

22.8.Challenges and Future of Quantum Computing

Discussion on the current challenges facing the field of quantum computing and potential directions for future research and development.

22.9.Quantum Supremacy and its Implications

Examination of the concept of quantum supremacy and its potential to revolutionize computing systems.

23.1 Quantum Computing in Systems Engineering

This course provides an in-depth exploration of quantum computing principles and their applications within the field of systems engineering. Students will gain a comprehensive understanding of both theoretical foundations and practical implementations of quantum technologies in designing and optimizing complex systems.

23.1 Introduction to Quantum Computing

An overview of the principles of quantum mechanics that form the basis of quantum computing technology, including qubits, superposition, and entanglement.

Key Topics:

- **Qubits:** Understanding the basic unit of quantum information.
- **Superposition:** How qubits can exist in multiple states simultaneously.
- **Entanglement:** The phenomenon where qubits become interconnected and the state of one affects the state of another.

23.2 Quantum Algorithms

Detailed study of key quantum algorithms such as Shor's algorithm and Grover's algorithm, and their implications for solving complex computational problems.

Key Topics:

- **Shor's Algorithm:** How it factors large numbers exponentially faster than classical algorithms.
- **Grover's Algorithm:** Quantum search algorithm providing quadratic speedup.
- **Implications:** Potential applications in cryptography, optimization, and more.

23.3 Quantum Gates and Circuits

Exploration of fundamental quantum gates and the construction of quantum circuits to perform computational tasks using qubits.

Key Topics:

- **Quantum Gates:** Basic gates such as Pauli-X, Hadamard, and CNOT.
- **Quantum Circuits:** Building and understanding circuits composed of quantum gates.

- **Quantum Operations:** Executing operations and measuring results.

23.4 Quantum Information Theory

Understanding the theoretical underpinnings of how quantum mechanics enhances information processing capabilities in systems engineering.

Key Topics:

- **Quantum Entropy:** Measures of information and uncertainty in quantum systems.
- **Quantum Error Correction:** Techniques to protect quantum information from errors.
- **Quantum Channels:** Understanding communication channels in quantum information theory.

23.5 Quantum Computing Platforms

Introduction to current quantum computing platforms and hardware, including superconducting qubits and trapped ions.

Key Topics:

- **Superconducting Qubits:** How they work and their role in quantum computers.
- **Trapped Ions:** Another leading technology for building quantum computers.
- **Quantum Hardware:** Overview of different types of quantum computing hardware.

23.6 Quantum Programming Languages

Learning and applying quantum programming languages such as Qiskit, Cirq, and Q# to develop quantum algorithms.

Key Topics:

- **Qiskit:** IBM's open-source quantum computing framework.
- **Cirq:** Google's framework for developing quantum algorithms.

- **Q#:** Microsoft's quantum programming language.
- **Algorithm Development:** Writing and testing quantum algorithms.

23.7 Applications of Quantum Computing in Systems Engineering

Investigation of potential applications of quantum computing in systems engineering, including optimization, simulation, and cryptography.

Key Topics:

- **Optimization:** Using quantum computing to solve complex optimization problems.
- **Simulation:** Quantum simulations of physical systems.
- **Cryptography:** How quantum computing can enhance or break cryptographic systems.

23.8 Challenges and Future of Quantum Computing

Discussion on the current challenges facing the field of quantum computing and potential directions for future research and development.

Key Topics:

- **Scalability:** Challenges in scaling up quantum computers.
- **Decoherence:** Addressing the issue of qubit stability over time.
- **Future Research:** Directions for advancements in quantum computing technology.

23.9 Quantum Supremacy and its Implications

Examination of the concept of quantum supremacy and its potential to revolutionize computing systems.

Key Topics:

- **Quantum Supremacy:** Understanding what it means for a quantum computer to outperform classical computers.
- **Implications:** The potential impact on various industries and fields.

- **Milestones:** Significant achievements in reaching quantum supremacy.

These courses provide a comprehensive understanding of quantum computing in systems engineering, equipping students with the knowledge and skills to innovate and lead in this rapidly evolving field.

23.1 topics:

4.1 .12.15..23.2.Neurotechnology in Educational Technology

This course explores the intersection of neurotechnology and educational technology, focusing on how advances in brain research and interface technologies can enhance learning experiences and outcomes. Students will delve into theoretical aspects, practical applications, as well as ethical implications of utilizing neurotechnology in education.

23.3.Introduction to Neurotechnology

This topic provides a foundational understanding of neurotechnology, including its history, development, and current state of the art. Students will learn about various devices and technologies used in neurotechnology.

23.4.Neuroscience Basics for Educators

An overview of essential neuroscience principles necessary for understanding how neurotechnology can be applied in educational contexts, focusing on brain structure and function in learning.

23.5.Brain-Computer Interfaces in Education

Examine how Brain-Computer Interfaces (BCIs) can be used to facilitate learning, including current applications and future possibilities.

23.6.Cognitive Load Theory and Neurotechnology

Understand how cognitive load theory informs the design of neurotechnology applications in learning environments.

23.7.Neuroscience-Based Adaptive Learning Technologies

Explore how adaptive learning technologies informed by neuroscience can personalize and enhance educational experiences.

23.8.Ethical and Social Implications

Consider the ethical and social implications of using neurotechnology in educational settings, including privacy concerns and consent.

23.9.Case Studies in Neurotechnology Education

Review real-world case studies where neurotechnology has been applied within educational contexts and assess their outcomes.

23.10.Future Trends in Neurotechnology for Education

Discuss and predict future trends in the deployment of neurotechnology for educational purposes, driven by technological and scientific advancements.

23.2 Neurotechnology in Educational Technology

This course explores the intersection of neurotechnology and educational technology, focusing on how advances in brain research and interface technologies can enhance learning experiences and outcomes. Students will delve into theoretical aspects, practical applications, as well as ethical implications of utilizing neurotechnology in education.

23.3 Introduction to Neurotechnology

This topic provides a foundational understanding of neurotechnology, including its history, development, and current state of the art. Students will learn about various devices and technologies used in neurotechnology.

Key Topics:

- **History and Development:** Tracing the evolution of neurotechnology from its inception to current advancements.
- **Devices and Technologies:** Overview of brain-computer interfaces (BCIs), neuroimaging tools, and neurofeedback devices.
- **Current State:** Understanding the latest innovations and applications in neurotechnology.

23.4 Neuroscience Basics for Educators

An overview of essential neuroscience principles necessary for understanding how neurotechnology can be applied in educational contexts, focusing on brain structure and function in learning.

Key Topics:

- **Brain Structure:** Understanding the anatomy of the brain and its relevance to learning.
- **Brain Function:** Exploring how different brain regions contribute to cognitive processes.
- **Neuroplasticity:** The brain's ability to adapt and reorganize, crucial for learning and memory.

23.5 Brain-Computer Interfaces in Education

Examine how Brain-Computer Interfaces (BCIs) can be used to facilitate learning, including current applications and future possibilities.

Key Topics:

- **BCI Technology:** Understanding how BCIs work and their potential in education.
- **Current Applications:** Examples of BCIs being used to aid learning and accessibility.
- **Future Possibilities:** Exploring innovative ways BCIs could transform education.

23.6 Cognitive Load Theory and Neurotechnology

Understand how cognitive load theory informs the design of neurotechnology applications in learning environments.

Key Topics:

- **Cognitive Load Theory:** Basics of cognitive load and its impact on learning.
- **Application Design:** Designing neurotechnology tools that optimize cognitive load.

- **Practical Examples:** Implementing cognitive load principles in educational technology.

23.7 Neuroscience-Based Adaptive Learning Technologies

Explore how adaptive learning technologies informed by neuroscience can personalize and enhance educational experiences.

Key Topics:

- **Adaptive Learning:** Principles and benefits of adaptive learning systems.
- **Neuroscience Insights:** How neuroscience informs the design of adaptive learning technologies.
- **Personalization:** Creating personalized learning experiences based on cognitive and neurological data.

23.8 Ethical and Social Implications

Consider the ethical and social implications of using neurotechnology in educational settings, including privacy concerns and consent.

Key Topics:

- **Ethical Considerations:** Addressing issues such as data privacy, informed consent, and potential biases.
- **Social Implications:** Understanding the broader impact of neurotechnology on society and education.
- **Regulatory Frameworks:** Overview of regulations governing the use of neurotechnology in education.

23.9 Case Studies in Neurotechnology Education

Review real-world case studies where neurotechnology has been applied within educational contexts and assess their outcomes.

Key Topics:

- **Case Studies:** Detailed examination of successful neurotechnology implementations in education.

- **Outcomes Assessment:** Evaluating the effectiveness and impact of neurotechnology on learning outcomes.
- **Lessons Learned:** Key takeaways and best practices from real-world examples.

23.10 Future Trends in Neurotechnology for Education

Discuss and predict future trends in the deployment of neurotechnology for educational purposes, driven by technological and scientific advancements.

Key Topics:

- **Emerging Trends:** Identifying new and upcoming trends in neurotechnology and education.
- **Future Directions:** Exploring potential future developments and innovations.
- **Research and Innovation:** Current and future research initiatives in the field of neurotechnology for education.

These courses provide a comprehensive understanding of neurotechnology applications in educational technology, equipping students with the knowledge and skills to innovate and lead in this rapidly evolving field.

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24. topics

4.1 .12.15.24.1.Robotic Process Automation in Electrochemical Engineering

This course explores the integration of Robotic Process Automation (RPA) within the field of Electrochemical Engineering. The course provides a comprehensive understanding of how automation technologies can enhance efficiency, accuracy, and productivity in electrochemical processes, ranging from battery manufacturing to fuel cell production. Students will gain skills in designing, implementing, and managing automated processes in electrochemical settings.

24.2Introduction to Robotic Process Automation

This module introduces the fundamentals of RPA, covering its history, benefits, and applications across various industries.

24.3.Fundamentals of Electrochemical Engineering

Explore the core principles of electrochemical engineering, including electrochemistry, materials science, and process design.

24.4.RPA Tools and Platforms

Gain insights into popular RPA tools and platforms like UiPath, Automation Anywhere, and Blue Prism. Understand their capabilities and use cases.

24.5.Automating Electrochemical Process Controls

Study the application of RPA in automating the control systems within electrochemical processes, improving precision and efficiency.

24.6.Data Collection and Analysis in Electrochemical Systems

Learn how RPA can facilitate data collection, analysis, and reporting in electrochemical systems, enhancing decision-making capabilities.

24.7.Machine Learning and RPA in Electrochemical Engineering

Explore the intersection of machine learning and RPA in electrochemical engineering for predictive maintenance and process optimization.

24.8.RPA Implementation Challenges and Solutions

Discuss the challenges faced during the implementation of RPA in electrochemical engineering and explore potential solutions.

24.9.Case Studies and Industry Applications

Analyze various case studies to understand how RPA has been applied successfully in the field of electrochemical engineering across different sectors.

4.1 Robotic Process Automation in Electrochemical Engineering

This course explores the integration of Robotic Process Automation (RPA) within the field of Electrochemical Engineering. The course provides a comprehensive understanding of how automation technologies can enhance efficiency, accuracy, and productivity in electrochemical processes, ranging from battery manufacturing to fuel cell production. Students will gain skills in designing, implementing, and managing automated processes in electrochemical settings.

24.2 Introduction to Robotic Process Automation

This module introduces the fundamentals of RPA, covering its history, benefits, and applications across various industries.

Key Topics:

- **History of RPA:** Understanding the origins and evolution of robotic process automation.
- **Benefits:** Exploring the advantages of RPA, such as increased efficiency, reduced errors, and cost savings.
- **Applications:** Examining how RPA is used in various industries, including finance, healthcare, and manufacturing.

24.3 Fundamentals of Electrochemical Engineering

Explore the core principles of electrochemical engineering, including electrochemistry, materials science, and process design.

Key Topics:

- **Electrochemistry Basics:** Understanding the chemical processes involved in electrochemical reactions.
- **Materials Science:** Studying the properties and behaviors of materials used in electrochemical systems.
- **Process Design:** Designing efficient and effective electrochemical processes.

24.4 RPA Tools and Platforms

Gain insights into popular RPA tools and platforms like UiPath, Automation Anywhere, and Blue Prism. Understand their capabilities and use cases.

Key Topics:

- **UiPath:** Overview of UiPath's features and applications.
- **Automation Anywhere:** Exploring Automation Anywhere's capabilities and use cases.
- **Blue Prism:** Understanding Blue Prism's tools and how they are used in RPA.

24.5 Automating Electrochemical Process Controls

Study the application of RPA in automating the control systems within electrochemical processes, improving precision and efficiency.

Key Topics:

- **Control Systems Automation:** Techniques for automating control systems in electrochemical processes.
- **Precision and Efficiency:** Enhancing precision and efficiency through automation.
- **Real-World Applications:** Examples of automated control systems in electrochemical engineering.

24.6 Data Collection and Analysis in Electrochemical Systems

Learn how RPA can facilitate data collection, analysis, and reporting in electrochemical systems, enhancing decision-making capabilities.

Key Topics:

- **Data Collection:** Techniques for automating data collection in electrochemical systems.
- **Data Analysis:** Using RPA to analyze data and generate insights.
- **Reporting:** Automating the generation of reports to support decision-making.

24.7 Machine Learning and RPA in Electrochemical Engineering

Explore the intersection of machine learning and RPA in electrochemical engineering for predictive maintenance and process optimization.

Key Topics:

- **Predictive Maintenance:** Using machine learning and RPA for predictive maintenance of electrochemical systems.
- **Process Optimization:** Enhancing process efficiency and effectiveness through machine learning and RPA.
- **Case Studies:** Real-world examples of machine learning and RPA in electrochemical engineering.

24.8 RPA Implementation Challenges and Solutions

Discuss the challenges faced during the implementation of RPA in electrochemical engineering and explore potential solutions.

Key Topics:

- **Implementation Challenges:** Identifying common challenges in RPA implementation.
- **Solutions:** Exploring strategies to overcome implementation challenges.
- **Best Practices:** Establishing best practices for successful RPA implementation.

24.9 Case Studies and Industry Applications

Analyze various case studies to understand how RPA has been applied successfully in the field of electrochemical engineering across different sectors.

Key Topics:

- **Case Studies:** Detailed analysis of successful RPA implementations in electrochemical engineering.
- **Industry Applications:** Exploring how different sectors use RPA in electrochemical processes.

- **Lessons Learned:** Understanding the key takeaways from real-world applications.

These courses provide a comprehensive understanding of robotic process automation in electrochemical engineering, equipping students with the knowledge and skills to enhance efficiency, accuracy, and productivity in this field

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25.1topics

4.1 .12.15.25.1.Integrating Educational Technology in Renewable Energy Studies

This course is designed for master's students interested in combining the fields of renewable energy and educational technology. It explores the role of technology in educating and informing about renewable energy, examining innovative teaching tools and strategies. Students will learn how to develop technology-driven educational materials and experiences aimed at increasing awareness, understanding, and adoption of renewable energy concepts.

25.2.Introduction to Renewable Energy

An overview of various renewable energy sources, including solar, wind, hydroelectric, and geothermal. Discussions will include the benefits and challenges of each type along with their current global usage.

25.3.Educational Technology Tools

Examines the digital tools and platforms available for creating engaging learning

25.4.Designing Interactive Learning Modules

This topic covers the methodologies and best practices for designing interactive and immersive learning modules using educational technology.

25.5.Gamification in Renewable Energy Education

Explores the concept of gamification and how game-like elements can enhance learning in renewable energy courses.

25.6.Virtual Labs and Simulations

Discusses the role of virtual labs and simulations in teaching complex renewable energy concepts.

25.7.Assessing Learner Outcomes in Technology-Driven Curriculum

This topic focuses on developing assessment strategies for technology-enhanced renewable energy education.

25.8.Case Studies in Renewable Energy Education

Analyzes real-world examples of successful renewable energy educational programs and the role of technology in their delivery.

25.9.Challenges in Integrating Technology and Renewable Energy Education

Addresses common challenges faced when integrating technology into renewable energy education and potential solution

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25.1 Integrating Educational Technology in Renewable Energy Studies

This course is designed for master's students interested in combining the fields of renewable energy and educational technology. It explores the role of technology in educating and informing about renewable energy, examining innovative teaching tools and strategies. Students will learn how to develop technology-driven educational materials and experiences aimed at increasing awareness, understanding, and adoption of renewable energy concepts.

25.2 Introduction to Renewable Energy

An overview of various renewable energy sources, including solar, wind, hydroelectric, and geothermal. Discussions will include the benefits and challenges of each type along with their current global usage.

Key Topics:

- **Solar Energy:** Principles, benefits, challenges, and global usage.
- **Wind Energy:** How wind power works, its advantages, and current implementation.

- **Hydroelectric Energy:** Understanding the mechanics and impact of hydroelectric power.
- **Geothermal Energy:** Exploring how geothermal energy is harnessed and its benefits.

25.3 Educational Technology Tools

Examines the digital tools and platforms available for creating engaging learning experiences.

Key Topics:

- **Digital Learning Platforms:** Overview of tools like Moodle, Canvas, and Google Classroom.
- **Interactive Tools:** Utilizing tools like Kahoot, Quizlet, and interactive whiteboards.
- **Content Creation:** Software for creating educational content, such as Adobe Captivate and Articulate Storyline.

25.4 Designing Interactive Learning Modules

This topic covers the methodologies and best practices for designing interactive and immersive learning modules using educational technology.

Key Topics:

- **Module Design:** Principles of designing effective interactive learning modules.
- **Immersive Learning:** Techniques to create immersive learning experiences.
- **Best Practices:** Strategies to enhance engagement and retention through interactivity.

25.5 Gamification in Renewable Energy Education

Explores the concept of gamification and how game-like elements can enhance learning in renewable energy courses.

Key Topics:

- **Gamification Principles:** Understanding the basics of gamification and its educational benefits.
- **Application in Education:** Implementing game elements like points, badges, and leaderboards in renewable energy education.
- **Impact on Learning:** How gamification improves motivation and engagement.

25.6 Virtual Labs and Simulations

Discusses the role of virtual labs and simulations in teaching complex renewable energy concepts.

Key Topics:

- **Virtual Labs:** Benefits and examples of virtual labs in renewable energy education.
- **Simulations:** Using simulations to teach and experiment with renewable energy concepts.
- **Implementation:** Best practices for integrating virtual labs and simulations into the curriculum.

25.7 Assessing Learner Outcomes in Technology-Driven Curriculum

This topic focuses on developing assessment strategies for technology-enhanced renewable energy education.

Key Topics:

- **Assessment Methods:** Different methods for assessing learner outcomes in tech-driven education.
- **Formative and Summative Assessment:** Utilizing both to measure progress and final understanding.
- **Data Analysis:** Using data from assessments to improve teaching strategies and learning outcomes.

25.8 Case Studies in Renewable Energy Education

Analyzes real-world examples of successful renewable energy educational programs and the role of technology in their delivery.

Key Topics:

- **Case Studies:** Detailed analysis of successful implementations of educational technology in renewable energy programs.
- **Technology's Role:** Understanding how technology facilitated learning and engagement.
- **Lessons Learned:** Key takeaways and best practices from real-world examples.

25.9 Challenges in Integrating Technology and Renewable Energy Education

Addresses common challenges faced when integrating technology into renewable energy education and potential solutions.

Key Topics:

- **Common Challenges:** Identifying barriers such as funding, access to technology, and teacher training.
- **Solutions:** Strategies to overcome these challenges.
- **Future Directions:** Exploring future trends and innovations in the field.

These courses provide a comprehensive understanding of how educational technology can be integrated into renewable energy studies, equipping students with the knowledge and skills to innovate and lead in this interdisciplinary fi

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26.1

4.1 .12.15.26.1Wholesale Trade Management in Industrial Engineering

This course is designed for students pursuing a Master's degree in Industrial Engineering with a focus on wholesale trade. It will cover the

essential aspects of wholesale trade management, including supply chain dynamics, inventory control, logistics, procurement, and market analysis. The course will blend technical engineering concepts with business strategies to enable students to effectively manage and innovate within the wholesale trade sector.

26.2.Introduction to Wholesale Trade

Explore the fundamentals of wholesale trade, its role in the supply chain, and the economic impact on industrial markets.

26.3.Supply Chain Dynamics

Understand the complexities of supply chain management, including network design, integration, and leveraging technology for efficiency.

26.4.Inventory Control Methods

Study various inventory management techniques, such as Just-In-Time, Economic Order Quantity, and ABC analysis to optimize stock levels.

26.5.Logistics and Distribution

Examine the logistics involved in wholesale trade, focusing on distribution networks, transportation management, and warehousing solutions.

26.6.Procurement Strategies

Learn about procurement processes and strategies, vendor selection, and relationship management to secure effective supply sources.

26.7.Market Analysis and Forecasting

Study techniques for market analysis, trend observation, and forecasting methods to drive strategic decisions in wholesale trade.

27.8.Risk Management in Wholesale Trade

Analyze risk management principles, identifying potential risks in the wholesale supply chain and developing mitigation strategies.

27.9.Regulatory and Ethical Considerations

Explore the regulatory landscape affecting wholesale trade and the ethical considerations of operating within the sector.

26.1 Wholesale Trade Management in Industrial Engineering

This course is designed for students pursuing a Master's degree in Industrial Engineering with a focus on wholesale trade. It will cover the essential aspects of wholesale trade management, including supply chain dynamics, inventory control, logistics, procurement, and market analysis. The course will blend technical engineering concepts with business strategies to enable students to effectively manage and innovate within the wholesale trade sector.

26.2 Introduction to Wholesale Trade

Explore the fundamentals of wholesale trade, its role in the supply chain, and the economic impact on industrial markets.

Key Topics:

- **Fundamentals:** Understanding the basics of wholesale trade.
- **Role in Supply Chain:** How wholesale trade fits within the broader supply chain.
- **Economic Impact:** Examining the economic significance of wholesale trade on industrial markets.

26.3 Supply Chain Dynamics

Understand the complexities of supply chain management, including network design, integration, and leveraging technology for efficiency.

Key Topics:

- **Network Design:** Principles of designing efficient supply chain networks.
- **Integration:** Integrating various components of the supply chain for seamless operations.
- **Technology:** Utilizing technology to enhance supply chain efficiency.

26.4 Inventory Control Methods

Study various inventory management techniques, such as Just-In-Time, Economic Order Quantity, and ABC analysis to optimize stock levels.

Key Topics:

- **Just-In-Time (JIT):** Minimizing inventory holding costs by receiving goods only as needed.
- **Economic Order Quantity (EOQ):** Calculating the optimal order quantity to minimize total inventory costs.
- **ABC Analysis:** Categorizing inventory to prioritize management efforts.

26.5 Logistics and Distribution

Examine the logistics involved in wholesale trade, focusing on distribution networks, transportation management, and warehousing solutions.

Key Topics:

- **Distribution Networks:** Designing and managing distribution networks.
- **Transportation Management:** Efficiently managing transportation logistics.
- **Warehousing Solutions:** Implementing effective warehousing strategies.

26.6 Procurement Strategies

Learn about procurement processes and strategies, vendor selection, and relationship management to secure effective supply sources.

Key Topics:

- **Procurement Processes:** Understanding procurement procedures and best practices.
- **Vendor Selection:** Criteria for selecting and evaluating vendors.
- **Relationship Management:** Building and maintaining strong supplier relationships.

26.7 Market Analysis and Forecasting

Study techniques for market analysis, trend observation, and forecasting methods to drive strategic decisions in wholesale trade.

Key Topics:

- **Market Analysis:** Techniques for analyzing market conditions and trends.
- **Trend Observation:** Identifying and interpreting market trends.
- **Forecasting Methods:** Using quantitative and qualitative methods to predict future market conditions.

26.8 Risk Management in Wholesale Trade

Analyze risk management principles, identifying potential risks in the wholesale supply chain and developing mitigation strategies.

Key Topics:

- **Risk Identification:** Identifying potential risks in the supply chain.
- **Mitigation Strategies:** Developing strategies to mitigate identified risks.
- **Risk Management Frameworks:** Implementing risk management frameworks to ensure supply chain resilience.

26.9 Regulatory and Ethical Considerations

Understand the regulatory and ethical considerations in wholesale trade, including compliance with laws and promoting ethical business practices.

Key Topics:

- **Regulatory Compliance:** Ensuring adherence to relevant laws and regulations.
- **Ethical Business Practices:** Promoting ethical behavior and corporate social responsibility.
- **Case Studies:** Analyzing real-world examples of regulatory and ethical challenges in wholesale trade.

These courses provide a comprehensive understanding of wholesale trade management in industrial engineering, equipping students with the knowledge and skills to effectively manage and innovate within the wholesale trade sector.

28.topics

4.1 .12.15..29. 1.Advanced Wireless Communications

This course explores the fundamental principles and advanced techniques of wireless communications, designed for students in electronic engineering. It covers critical concepts, system designs, and the latest advancements in wireless technologies to prepare students for careers in the telecommunications industry.

29.2.Introduction to Wireless Communications

Overview of wireless communication systems, historical developments, and contemporary applications.

29.3.Radio Frequency Fundamentals

Exploration of radio frequency (RF) spectrum, key RF principles, and their application in wireless communication.

29.4.Wireless Signal Propagation

Understanding the behavior of wireless signals over various media and environments, including path loss, fading, and interference.

29.5.Multiple Access Techniques

Survey of multiple access schemes including FDMA, TDMA, CDMA, and OFDMA, which enable multiple users to share the same frequency band.

29.6.Wireless Networking and Protocols

Introduction to wireless network design, including protocol layers, network architectures, and routing protocols.

29.7.Cellular Systems and 5G

In-depth analysis of cellular network architecture, with a focus on the evolution from 1G to 5G, and future trends.

29.8..Antenna Theory and Design

Study of antenna characteristics, types, and their utilization in wireless communication systems.

29.8Wireless Security

Exploration of security challenges and solutions in wireless communications, including encryption and authentication methodologies.

29.6IoT and Wireless Sensor Networks

Examination of Internet of Things (IoT) concepts, architectures, and the role of wireless sensor networks in IoT implementations.

29.1 Advanced Wireless Communications

This course explores the fundamental principles and advanced techniques of wireless communications, designed for students in electronic engineering. It covers critical concepts, system designs, and the latest advancements in wireless technologies to prepare students for careers in the telecommunications industry.

29.2 Introduction to Wireless Communications

Overview of wireless communication systems, historical developments, and contemporary applications.

Key Topics:

- **Wireless Communication Systems:** Basic principles and components of wireless communication systems.
- **Historical Developments:** Key milestones in the evolution of wireless communications.
- **Contemporary Applications:** Current uses of wireless technology in various fields.

29.3 Radio Frequency Fundamentals

Exploration of radio frequency (RF) spectrum, key RF principles, and their application in wireless communication.

Key Topics:

- **RF Spectrum:** Understanding the RF spectrum and its allocation.
- **RF Principles:** Basics of RF communication, including modulation and demodulation.
- **Applications:** Practical uses of RF technology in wireless communication.

29.4 Wireless Signal Propagation

Understanding the behavior of wireless signals over various media and environments, including path loss, fading, and interference.

Key Topics:

- **Signal Propagation:** How wireless signals travel through different media.
- **Path Loss:** Factors affecting the attenuation of signal strength.
- **Fading and Interference:** Understanding and mitigating fading and interference effects.

29.5 Multiple Access Techniques

Survey of multiple access schemes including FDMA, TDMA, CDMA, and OFDMA, which enable multiple users to share the same frequency band.

Key Topics:

- **FDMA (Frequency Division Multiple Access):** Assigning different frequency bands to multiple users.
- **TDMA (Time Division Multiple Access):** Allocating time slots to multiple users on the same frequency.
- **CDMA (Code Division Multiple Access):** Using unique codes to differentiate users sharing the same frequency.

- **OFDMA (Orthogonal Frequency Division Multiple Access):** Combining multiple sub-carriers to improve efficiency and performance.

29.6 Wireless Networking and Protocols

Introduction to wireless network design, including protocol layers, network architectures, and routing protocols.

Key Topics:

- **Protocol Layers:** Understanding the different layers in wireless communication protocols.
- **Network Architectures:** Designing and implementing wireless network architectures.
- **Routing Protocols:** Overview of routing protocols used in wireless networks.

29.7 Cellular Systems and 5G

In-depth analysis of cellular network architecture, with a focus on the evolution from 1G to 5G, and future trends.

Key Topics:

- **Cellular Network Architecture:** Structure and components of cellular networks.
- **1G to 5G Evolution:** Historical progression and key features of each generation.
- **Future Trends:** Emerging technologies and advancements in cellular communications.

29.8 Antenna Theory and Design

Study of antenna characteristics, types, and their utilization in wireless communication systems.

Key Topics:

- **Antenna Characteristics:** Key parameters and performance metrics of antennas.

- **Types of Antennas:** Different types of antennas used in wireless communication.
- **Design and Utilization:** Designing and deploying antennas for optimal performance.

29.9 Wireless Security

Exploration of security challenges and solutions in wireless communications, including encryption and authentication methodologies.

Key Topics:

- **Security Challenges:** Identifying common security threats in wireless communication.
- **Encryption:** Techniques for securing wireless communication through encryption.
- **Authentication:** Methods for verifying the identity of users and devices.

29.10 IoT and Wireless Sensor Networks

Examination of Internet of Things (IoT) concepts, architectures, and the role of wireless sensor networks in IoT implementations.

Key Topics:

- **IoT Concepts:** Understanding the basic principles and applications of IoT.
- **Architectures:** Designing IoT systems and integrating wireless sensor networks.
- **Wireless Sensor Networks:** Deploying and managing sensor networks for IoT applications.

These courses provide a comprehensive understanding of advanced wireless communications, equipping students with the knowledge and skills to excel in the telecommunications industry.

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30 topics

4.1 .12.15.30.1.Advanced Electrical Engineering in Construction and Civil Engineering

This course provides an in-depth understanding of electrical engineering principles and their applications in construction and civil engineering. Students will learn about the integration of electrical systems within construction projects, the challenges of implementing sustainable energy solutions, and the latest technologies in the field. Emphasis is placed on practical analysis, design, and problem-solving skills necessary for modern construction projects.

30.2. Fundamentals of Electrical Systems in Construction

Overview of electrical systems essential in construction projects, including power distribution, lighting, and wiring systems.

30.3.Electrical Safety Standards and Codes

Detailed study of electrical safety standards, codes, and regulations specific to construction sites.

30.4.Integration of Electrical Systems in Building Design

Techniques for integrating electrical systems with architectural and structural frameworks in buildings.

30.5Sustainable and Renewable Energy Technologies

Exploration of sustainable and renewable energy technologies applicable to construction projects.

30.6.Smart Grids and Intelligent Networks

Study of smart grid technologies and their application in modern urban infrastructure.

30.7.Electrical System Design and Simulation

Practical approaches to the design and simulation of electrical systems for construction projects using industry-standard software.

30.8.Power Quality and Energy Management

Analysis of power quality issues and energy management strategies for improved efficiency.

30.9.Electrical Systems in Infrastructure Projects

Examination of the role of electrical engineering in large-scale infrastructure projects, such as transportation and water systems

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Advanced Electrical Engineering in Construction and Civil Engineering

This course provides an in-depth understanding of electrical engineering principles and their applications in construction and civil engineering. Students will learn about the integration of electrical systems within construction projects, the challenges of implementing sustainable energy solutions, and the latest technologies in the field. Emphasis is placed on practical analysis, design, and problem-solving skills necessary for modern construction projects.

30.2 Fundamentals of Electrical Systems in Construction

Overview of electrical systems essential in construction projects, including power distribution, lighting, and wiring systems.

Key Topics:

- **Power Distribution:** Understanding the design and implementation of power distribution systems.
- **Lighting Systems:** Techniques for efficient lighting design in construction projects.
- **Wiring Systems:** Best practices for wiring systems, including safety and compliance.

30.3 Electrical Safety Standards and Codes

Detailed study of electrical safety standards, codes, and regulations specific to construction sites.

Key Topics:

- **Safety Standards:** Overview of key electrical safety standards.
- **Codes and Regulations:** Understanding and complying with electrical codes and regulations.

- **Site Safety:** Implementing safety practices on construction sites to prevent electrical hazards.

30.4 Integration of Electrical Systems in Building Design

Techniques for integrating electrical systems with architectural and structural frameworks in buildings.

Key Topics:

- **System Integration:** Strategies for seamlessly integrating electrical systems within building designs.
- **Coordination with Other Trades:** Ensuring coordination between electrical systems and other construction trades.
- **Design Optimization:** Techniques for optimizing electrical designs for efficiency and performance.

30.5 Sustainable and Renewable Energy Technologies

Exploration of sustainable and renewable energy technologies applicable to construction projects.

Key Topics:

- **Solar Energy:** Implementation of solar panels and photovoltaic systems in construction.
- **Wind Energy:** Integrating wind turbines and other wind energy systems.
- **Energy Storage:** Utilizing energy storage solutions such as batteries and thermal storage.

30.6 Smart Grids and Intelligent Networks

Study of smart grid technologies and their application in modern urban infrastructure.

Key Topics:

- **Smart Grid Technologies:** Understanding the components and benefits of smart grids.

- **Intelligent Networks:** Designing and managing intelligent networks for energy distribution.
- **Urban Infrastructure:** Applying smart grid technologies to modern urban infrastructure projects.

30.7 Electrical System Design and Simulation

Practical approaches to the design and simulation of electrical systems for construction projects using industry-standard software.

Key Topics:

- **Design Software:** Tools and software for electrical system design and simulation.
- **Simulation Techniques:** Methods for simulating electrical systems to predict performance.
- **Project Examples:** Case studies of electrical system design and simulation in real-world projects.

30.8 Power Quality and Energy Management

Analysis of power quality issues and energy management strategies for improved efficiency.

Key Topics:

- **Power Quality:** Identifying and addressing power quality issues such as voltage sags, harmonics, and transients.
- **Energy Management:** Strategies for efficient energy management in construction projects.
- **Efficiency Improvement:** Techniques for improving the overall efficiency of electrical systems.

30.9 Electrical Systems in Infrastructure Projects

Examination of the role of electrical engineering in large-scale infrastructure projects, such as transportation and water systems.

Key Topics:

- **Transportation Systems:** Electrical engineering applications in transportation infrastructure.
- **Water Systems:** Designing and managing electrical systems in water treatment and distribution.
- **Infrastructure Projects:** Examples of large-scale infrastructure projects and their electrical requirements.

These courses provide a comprehensive understanding of advanced electrical engineering principles and their application in construction and civil engineering, equipping students with the knowledge and skills to effectivel

4.1 .12.15.Electrical Systems in Construction and Civil Engineering

This master's level course is designed to bridge the fields of construction and civil engineering with electrical engineering principles. Students will learn to integrate electrical systems into construction projects effectively, ensuring safety, efficiency, and innovation in modern infrastructure.

Introduction to Electrical Systems in Construction

Overview of electrical systems integration in construction projects, considering design, installation, and maintenance.

Power Distribution in Buildings

Explore the principles and challenges of power distribution systems in modern buildings, including load assessments and distribution panels.

Lighting Systems and Design

Study the design and implementation of efficient lighting systems in commercial and residential buildings.

Electrical Safety Standards and Regulations

Learn about international and local electrical safety standards and regulations pertinent to construction projects.

Sustainability in Electrical Engineering

Understand sustainable practices and technologies, such as solar power and energy efficiency in construction.

Smart Buildings and IoT Integration

Examine the incorporation of smart technologies and IoT in building systems for improved energy management and automation.

Electrical Load Analysis and Estimation

Learn methods to analyze electrical loads and estimate demand for optimal system design.

Integration of Renewable Energy Sources

Explore the potential of integrating renewable energy sources into construction projects and urban environments.

Project Management in Electrical Engineering

Develop skills in managing electrical engineering projects within the construction industry, focusing on timelines, budgets, and resource allocation.

30.1topics

4.1 .12.15.30.1.Doctorate in Specialist Engineering Infrastructure and Contractors: Electrical Engineering

This advanced course is designed for students pursuing a Doctorate degree in Specialist Engineering Infrastructure and Contractors with a focus on Electrical Engineering. The course aims to equip students with in-depth knowledge and practical skills necessary for the design, implementation, and management of electrical infrastructure projects. Students will explore contemporary challenges, innovative solutions, and emerging technologies in electrical engineering.

30.2.Advanced Power System Analysis

Exploration of power flow analysis, fault analysis, and stability assessment in large-scale electrical power systems with a focus on real-world applications.

30.3Renewable Energy Systems

An in-depth examination of renewable energy technology integration, focusing on wind, solar, and hydroelectric power systems.

30.4.Electrical Infrastructure Design and Management

Comprehensive overview of electrical infrastructure planning, design methodologies, and management practices for efficient operation.

31.5.Smart Grids and IoT Applications

Study of smart grid technology, IoT applications in electrical systems, and their impact on efficiency and sustainability.

31.6..High Voltage Engineering

Analysis of high voltage engineering principles, equipment, and testing methodologies in power transmission.

31.7.Project Management in Electrical Engineering

Principles and practices of effective project management tailored to electrical engineering projects and infrastructure.

31.8Energy Policy and Ethical Considerations

Examination of energy policies, regulatory frameworks, and ethical considerations impacting electrical infrastructure projects.

31.1Sustainable Electrical Engineering Practices

Strategies for incorporating sustainable practices in the planning, design, and execution of electrical engineering projects

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30.1 Doctorate in Specialist Engineering Infrastructure and Contractors: Electrical Engineering

This advanced course is designed for students pursuing a Doctorate degree in Specialist Engineering Infrastructure and Contractors with a focus on Electrical Engineering. The course aims to equip students with in-depth knowledge and practical skills necessary for the design, implementation, and management of electrical infrastructure projects. Students will explore contemporary challenges, innovative solutions, and emerging technologies in electrical engineering.

30.2 Advanced Power System Analysis

Exploration of power flow analysis, fault analysis, and stability assessment in large-scale electrical power systems with a focus on real-world applications.

Key Topics:

- **Power Flow Analysis:** Techniques for analyzing the flow of electrical power in networks.
- **Fault Analysis:** Identifying and mitigating faults in power systems.
- **Stability Assessment:** Evaluating and ensuring the stability of power systems.

30.3 Renewable Energy Systems

An in-depth examination of renewable energy technology integration, focusing on wind, solar, and hydroelectric power systems.

Key Topics:

- **Wind Energy:** Understanding the technology and integration of wind power systems.
- **Solar Energy:** Exploring photovoltaic systems and their applications.
- **Hydroelectric Power:** Implementing hydroelectric systems in renewable energy projects.

30.4 Electrical Infrastructure Design and Management

Comprehensive overview of electrical infrastructure planning, design methodologies, and management practices for efficient operation.

Key Topics:

- **Infrastructure Planning:** Strategies for effective electrical infrastructure planning.
- **Design Methodologies:** Best practices in designing electrical infrastructure.
- **Management Practices:** Techniques for managing and maintaining electrical systems.

31.5 Smart Grids and IoT Applications

Study of smart grid technology, IoT applications in electrical systems, and their impact on efficiency and sustainability.

Key Topics:

- **Smart Grid Technology:** Understanding the components and benefits of smart grids.
- **IoT in Electrical Systems:** Integrating IoT devices to enhance electrical system performance.
- **Efficiency and Sustainability:** Improving efficiency and sustainability through smart grid and IoT applications.

31.6 High Voltage Engineering

Analysis of high voltage engineering principles, equipment, and testing methodologies in power transmission.

Key Topics:

- **High Voltage Principles:** Core principles of high voltage engineering.
- **Equipment:** Understanding high voltage equipment and its applications.
- **Testing Methodologies:** Techniques for testing and ensuring the reliability of high voltage systems.

31.7 Project Management in Electrical Engineering

Principles and practices of effective project management tailored to electrical engineering projects and infrastructure.

Key Topics:

- **Project Planning:** Techniques for planning electrical engineering projects.
- **Resource Management:** Managing resources effectively in electrical projects.

- **Risk Management:** Identifying and mitigating risks in project management.

31.8 Energy Policy and Ethical Considerations

Examination of energy policies, regulatory frameworks, and ethical considerations impacting electrical infrastructure projects.

Key Topics:

- **Energy Policies:** Understanding policies that influence electrical engineering.
- **Regulatory Frameworks:** Complying with regulations in electrical infrastructure projects.
- **Ethical Considerations:** Addressing ethical issues in electrical engineering.

31.9 Sustainable Electrical Engineering Practices

Strategies for incorporating sustainable practices in the planning, design, and execution of electrical engineering projects.

Key Topics:

- **Sustainable Design:** Principles of designing sustainable electrical systems.
- **Energy Efficiency:** Implementing energy-efficient practices in electrical engineering.
- **Environmental Impact:** Reducing the environmental impact of electrical projects.

These courses provide a comprehensive understanding of specialist engineering infrastructure and contractors with a focus on electrical engineering, equipping students with the knowledge and skills to effectively manage and innovate within the field

32.Topic

4.1 .12.15..32.1Clean Energy Technology: Ecotechnology Applications

This course provides an in-depth understanding of clean energy technologies with a focus on ecotechnology. It explores various aspects of renewable energy, sustainable practices, and innovations that contribute to reducing environmental impacts and fostering ecological balance. Students will gain expertise in evaluating and implementing clean energy systems within a framework of ecological sustainability and environmental responsibility.

32.3.Introduction to Clean Energy and Ecotechnology

An overview of clean energy principles, the importance of ecotechnology, and how these fields integrate to promote sustainable development.

32.4.Solar Energy Technologies

Exploration of solar energy systems, including photovoltaic and solar thermal technologies, and their applications in sustainable energy solutions.

32.5.Wind Energy Systems

Study of wind energy generation, the mechanics of wind turbines, and the potential of wind power as a clean energy source.

32.6.Bioenergy and Biomass

Understanding the role of biomass in clean energy systems, including conversion technologies and sustainable biomass sourcing.

32.7.Hydropower and Ocean Energy

Exploration of hydropower technologies and emerging ocean energy systems such as tidal and wave energy, focusing on their ecological impact and potential.

32.8.Geothermal Energy

An examination of geothermal energy technologies, their environmental implications, and their role in global clean energy strategies.

32.9.Energy Storage and Smart Grids

Understanding the role of energy storage technologies and smart grid systems in enhancing the efficiency and reliability of clean energy distribution.

32.10.Policy and Economics of Clean Energy

Analysis of the policies and economic factors that influence clean energy adoption, with a focus on incentivizing ecotechnological innovations.

32.11Ecological Impact of Renewable Energy

Evaluating the ecological impacts of renewable energy projects and the methods to mitigate negative effects on the environment.

32.12.Future Directions in Clean Energy and Ecotechnology

Exploration of upcoming trends and innovations in clean energy and ecotechnology, including research and development prospects.

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2.1 Clean Energy Technology: Ecotechnology Applications

This course provides an in-depth understanding of clean energy technologies with a focus on ecotechnology. It explores various aspects of renewable energy, sustainable practices, and innovations that contribute to reducing environmental impacts and fostering ecological balance. Students will gain expertise in evaluating and implementing clean energy systems within a framework of ecological sustainability and environmental responsibility.

32.3 Introduction to Clean Energy and Ecotechnology

An overview of clean energy principles, the importance of ecotechnology, and how these fields integrate to promote sustainable development.

Key Topics:

- **Clean Energy Principles:** Understanding the basic concepts of clean energy.
- **Importance of Ecotechnology:** The role of ecotechnology in achieving sustainable development.

- **Integration:** How clean energy and ecotechnology work together to promote environmental sustainability.

32.4 Solar Energy Technologies

Exploration of solar energy systems, including photovoltaic and solar thermal technologies, and their applications in sustainable energy solutions.

Key Topics:

- **Photovoltaic Systems:** Basics and applications of photovoltaic solar panels.
- **Solar Thermal Technologies:** Understanding solar thermal energy and its uses.
- **Sustainable Solutions:** Implementing solar technologies in sustainable energy projects.

32.5 Wind Energy Systems

Study of wind energy generation, the mechanics of wind turbines, and the potential of wind power as a clean energy source.

Key Topics:

- **Wind Energy Generation:** Principles of generating energy from wind.
- **Wind Turbines:** Mechanics and design of wind turbines.
- **Potential and Applications:** Evaluating the potential of wind power as a renewable energy source.

32.6 Bioenergy and Biomass

Understanding the role of biomass in clean energy systems, including conversion technologies and sustainable biomass sourcing.

Key Topics:

- **Biomass:** Types of biomass used in energy production.
- **Conversion Technologies:** Methods of converting biomass into usable energy.

- **Sustainable Sourcing:** Ensuring sustainable practices in sourcing biomass.

32.7 Hydropower and Ocean Energy

Exploration of hydropower technologies and emerging ocean energy systems such as tidal and wave energy, focusing on their ecological impact and potential.

Key Topics:

- **Hydropower Technologies:** Basics of hydropower generation.
- **Ocean Energy Systems:** Understanding tidal and wave energy technologies.
- **Ecological Impact:** Assessing the ecological effects of hydropower and ocean energy projects.

32.8 Geothermal Energy

An examination of geothermal energy technologies, their environmental implications, and their role in global clean energy strategies.

Key Topics:

- **Geothermal Technologies:** Basics of geothermal energy production.
- **Environmental Implications:** Understanding the impact of geothermal energy on the environment.
- **Global Strategies:** Role of geothermal energy in worldwide clean energy initiatives.

32.9 Energy Storage and Smart Grids

Understanding the role of energy storage technologies and smart grid systems in enhancing the efficiency and reliability of clean energy distribution.

Key Topics:

- **Energy Storage Technologies:** Exploring different types of energy storage solutions.

- **Smart Grids:** Basics of smart grid technology and its benefits.
- **Efficiency and Reliability:** Improving energy distribution through advanced storage and smart grid systems.

32.10 Policy and Economics of Clean Energy

Analysis of the policies and economic factors that influence clean energy adoption, with a focus on incentivizing ecotechnological innovations.

Key Topics:

- **Clean Energy Policies:** Understanding the policy landscape for clean energy.
- **Economic Factors:** Evaluating the economic benefits and challenges of clean energy adoption.
- **Incentives:** Exploring incentives and support mechanisms for ecotechnology innovations.

32.11 Ecological Impact of Renewable Energy

Evaluating the ecological impacts of renewable energy projects and the methods to mitigate negative effects on the environment.

Key Topics:

- **Impact Assessment:** Techniques for assessing the ecological impact of renewable energy projects.
- **Mitigation Strategies:** Methods to reduce the environmental impact of clean energy systems.
- **Best Practices:** Implementing best practices for ecological sustainability in renewable energy.

32.12 Future Directions in Clean Energy and Ecotechnology

Exploration of upcoming trends and innovations in clean energy and ecotechnology, including research and development prospects.

Key Topics:

- **Emerging Trends:** Identifying new trends and innovations in clean energy and ecotechnology.
- **Research and Development:** Current and future research initiatives in the field.
- **Future Prospects:** Predicting future directions and advancements in clean energy and ecotechnology.

These courses provide a comprehensive understanding of clean energy technology and ecotechnology applications, equipping students with the knowledge and skills to innovate and lead in this field.

33.Topics

4.1 .12.15.33.1Integration of Electronic Engineering in Construction and Civil Engineering

This course aims to explore the integration of electronic engineering principles within the domains of construction and civil engineering. The course will cover the utilization of electronic systems for improved construction processes, smart infrastructure, and sustainable development. Students will gain interdisciplinary knowledge and practical skills to innovate and optimize civil engineering projects using electronic solutions.

33.2.Introduction to Electronic Systems in Civil Engineering

This topic provides an overview of the role and importance of electronic systems in the construction and civil engineering industries.

33.3.Smart Construction Technologies

Exploring various smart construction technologies enabled by electronic systems such as sensors, IoT devices, and automation.

33.4.IoT in Infrastructure Management

Understanding how IoT devices are used in managing and monitoring infrastructure and civil engineering projects.

33.5.Electronic Monitoring and Control Systems

This topic covers the usage of electronic systems for monitoring and control within large-scale construction projects.

33.6.Automation in Construction Machinery

Explore how electronic engineering drives the automation of construction machinery for enhanced efficiency and precision.

33.7.Solar and Renewable Energy Systems in Civil Engineering

Investigate how electronic engineering aids in integrating solar and renewable energy systems into modern civil engineering projects.

33.8.Building Information Modeling (BIM) and Electronic Systems

Understand the role of electronic systems in enhancing Building Information Modeling processes.

33.9.Cybersecurity in Smart Infrastructure

Learn about the importance of cybersecurity systems to protect smart civil infrastructure from digital threats.

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33.1 Integration of Electronic Engineering in Construction and Civil Engineering

This course aims to explore the integration of electronic engineering principles within the domains of construction and civil engineering. The course will cover the utilization of electronic systems for improved construction processes, smart infrastructure, and sustainable development. Students will gain interdisciplinary knowledge and practical skills to innovate and optimize civil engineering projects using electronic solutions.

33.2 Introduction to Electronic Systems in Civil Engineering

This topic provides an overview of the role and importance of electronic systems in the construction and civil engineering industries.

Key Topics:

- **Role and Importance:** Understanding how electronic systems are essential in modern construction and civil engineering.

- **Applications:** Examples of electronic systems used in these industries.
- **Technological Integration:** How electronic engineering is integrated into construction projects.

33.3 Smart Construction Technologies

Exploring various smart construction technologies enabled by electronic systems such as sensors, IoT devices, and automation.

Key Topics:

- **Sensors:** Use of sensors for real-time monitoring and data collection.
- **IoT Devices:** Implementing IoT devices to create connected construction sites.
- **Automation:** Enhancing construction processes through automation technologies.

33.4 IoT in Infrastructure Management

Understanding how IoT devices are used in managing and monitoring infrastructure and civil engineering projects.

Key Topics:

- **IoT Devices:** Types and functions of IoT devices in infrastructure management.
- **Monitoring:** Techniques for using IoT to monitor infrastructure health and performance.
- **Management:** Strategies for managing infrastructure projects using IoT technologies.

33.5 Electronic Monitoring and Control Systems

This topic covers the usage of electronic systems for monitoring and control within large-scale construction projects.

Key Topics:

- **Monitoring Systems:** Implementing electronic systems to monitor construction activities.
- **Control Systems:** Using electronic control systems to manage construction processes.
- **Large-Scale Projects:** Examples of electronic monitoring and control in large construction projects.

33.6 Automation in Construction Machinery

Explore how electronic engineering drives the automation of construction machinery for enhanced efficiency and precision.

Key Topics:

- **Construction Machinery:** Types of machinery that can be automated.
- **Efficiency and Precision:** Benefits of automation in construction machinery.
- **Technology Integration:** How electronic engineering enables automation in construction equipment.

33.7 Solar and Renewable Energy Systems in Civil Engineering

Investigate how electronic engineering aids in integrating solar and renewable energy systems into modern civil engineering projects.

Key Topics:

- **Solar Energy Systems:** Design and integration of solar energy solutions.
- **Renewable Energy:** Incorporating various renewable energy sources in civil engineering.
- **Sustainability:** Promoting sustainable development through renewable energy systems.

33.8 Building Information Modeling (BIM) and Electronic Systems

Understand the role of electronic systems in enhancing Building Information Modeling processes.

Key Topics:

- **BIM Technology:** Basics and benefits of Building Information Modeling.
- **Electronic Integration:** How electronic systems improve BIM processes.
- **Efficiency and Collaboration:** Enhancing project efficiency and collaboration through BIM.

33.9 Cybersecurity in Smart Infrastructure

Learn about the importance of cybersecurity systems in protecting smart infrastructure from cyber threats.

Key Topics:

- **Cybersecurity Principles:** Understanding the basics of cybersecurity.
- **Smart Infrastructure:** Identifying vulnerabilities in smart infrastructure systems.
- **Protection Strategies:** Implementing cybersecurity measures to protect smart infrastructure.

These courses provide a comprehensive understanding of how electronic engineering can be integrated into construction and civil engineering, equipping students with the knowledge and skills to innovate and optimize projects using electronic solution

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34.1.Topic

4.1 .12.15..34.2.Masters in Immutable Data Storage Solutions for Web Design

This course provides an advanced understanding of immutable data storage solutions specifically tailored for web design. Students will explore the principles of immutable data, analyze different storage solutions, and apply

best practices in the context of developing modern, resilient web applications.

34.3.Introduction to Immutable Data

An overview of immutable data, its importance in web design, and basic concepts such as data structures and potential benefits.

33.4.Immutable Data Structures

Discussion on various immutable data structures such as lists, sets, and maps. Understanding their use and advantages in web development.

33.5.Immutable.js and Alternatives

An examination of popular libraries like Immutable.js and other alternatives that offer immutable data structures in JavaScript.

33.6.State Management with Immutable Data

Exploring how immutable data can simplify state management in web applications, with a focus on integrating with popular frameworks.

33.7.Performance Benefits of Immutable Data

Investigating the performance benefits that immutable data can bring to web applications and how these benefits can be maximized.

33.8.GraphQL and Immutable Data

Integrating immutable data with GraphQL endpoints and understanding the implications for web application design.

33.9.Immutable Data in Server-Side Rendering (SSR)

Utilizing immutable data in server-side rendering processes to boost performance and maintain data consistency.

33.10.Security and Immutable Data

Understanding security concerns and best practices when implementing immutable data storage solutions in web applications.

33.11.Future Trends in Immutable Data

Exploring future trends and developments in immutable data storage solutions and how they might impact web design.

Masters in Immutable Data Storage Solutions for Web Design

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34.2 Introduction to Immutable Data

An overview of immutable data, its importance in web design, and basic concepts such as data structures and potential benefits.

Key Topics:

- **Basics of Immutable Data:** Understanding what immutable data is and why it's important.
- **Data Structures:** Exploring the types of data structures used in immutable data.
- **Benefits:** Identifying the potential benefits of using immutable data in web design.

34.3 Immutable Data Structures

Discussion on various immutable data structures such as lists, sets, and maps. Understanding their use and advantages in web development.

Key Topics:

- **Lists:** Using immutable lists and their advantages.
- **Sets:** Implementing immutable sets for unique data storage.
- **Maps:** Exploring the use of immutable maps and their benefits.

34.4

34.Topic

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- **Maps:** Exploring the use of immutable maps and their benefits.

34.4

35.1.Topic

4.1 .12.15..35.2.Advanced Cyber-Physical Systems in Telecommunications

This course explores the intersection of cyber-physical systems and telecommunications, providing an in-depth understanding of how these technologies integrate to create innovative solutions. The course covers the architecture, design, and implementation of next-generation telecommunication systems using cyber-physical components, with a keen focus on real-world applications and research developments.

35.3.Introduction to Cyber-Physical Systems

Understand the core concepts and significance of cyber-physical systems (CPS) in the modern world, particularly in the telecommunications industry.

35.4.Network Architecture in CPS

Study the architectural principles of integrating CPS with telecommunication networks, including topologies, network protocols, and infrastructure.

35.5..IoT and Cyber-Physical Systems

Explore the role of the Internet of Things (IoT) as a component of CPS, focusing on its application in telecommunications.

35.6.Security and Privacy in CPS

Examine security challenges and privacy concerns in CPS, particularly how these affect telecommunication systems.

35.7.Real-time Data Processing and Analytics

Learn about the techniques and technologies used for real-time data processing and analytics in the context of CPS and telecommunications.

35.8.Machine Learning in Cyber-Physical Systems

Understand how machine learning can be applied to optimize and innovate CPS within tele----------communications.

35.9.Emerging Trends in CPS and Telecommunications

Discover the latest research and technological trends shaping the future of CPS in the telecom sector.

35.10.CPS Case Studies in Telecommunications

Analyze real-world case studies where CPS has been effectively integrated into telecommunications systems.

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35.2 Advanced Cyber-Physical Systems in Telecommunications

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35.3 Introduction to Cyber-Physical Systems

Understand the core concepts and significance of cyber-physical systems (CPS) in the modern world, particularly in the telecommunications industry.

Key Topics:

- **Core Concepts:** Basics of CPS and their importance in modern technology.

- **Significance:** Understanding why CPS are crucial in telecommunications.
- **Applications:** Various applications of CPS in different sectors.

35.4 Network Architecture in CPS

Study the architectural principles of integrating CPS with telecommunication networks, including topologies, network protocols, and infrastructure.

Key Topics:

- **Architectural Principles:** Fundamentals of network architecture in CPS.
- **Topologies:** Different types of network topologies used in CPS.
- **Network Protocols:** Understanding network protocols for CPS integration.
- **Infrastructure:** Building and managing CPS infrastructure in telecommunications.

35.5 IoT and Cyber-Physical Systems

Explore the role of the Internet of Things (IoT) as a component of CPS, focusing on its application in telecommunications.

Key Topics:

- **IoT Basics:** Understanding the fundamentals of IoT.
- **IoT in CPS:** How IoT devices integrate with CPS.
- **Applications in Telecommunications:** Using IoT for enhancing telecommunications systems.

35.6 Security and Privacy in CPS

Examine security challenges and privacy concerns in CPS, particularly how these affect telecommunication systems.

Key Topics:

- **Security Challenges:** Identifying and addressing security issues in CPS.
- **Privacy Concerns:** Ensuring data privacy in CPS applications.
- **Impact on Telecommunications:** Understanding how security and privacy issues affect telecom systems.

35.7 Real-time Data Processing and Analytics

Learn about the techniques and technologies used for real-time data processing and analytics in the context of CPS and telecommunications.

Key Topics:

- **Real-time Processing:** Techniques for real-time data processing in CPS.
- **Analytics:** Using analytics to gain insights from CPS data.
- **Technologies:** Tools and technologies for real-time data processing and analytics.

35.8 Machine Learning in Cyber-Physical Systems

Understand how machine learning can be applied to optimize and innovate CPS within telecommunications.

Key Topics:

- **Machine Learning Basics:** Introduction to machine learning concepts.
- **Applications in CPS:** How machine learning enhances CPS functionality.
- **Telecommunications:** Using machine learning for innovative solutions in telecom systems.

35.9 Emerging Trends in CPS and Telecommunications

Discover the latest research and technological trends shaping the future of CPS in the telecom sector.

Key Topics:

- **Research Developments:** Latest research in CPS and telecommunications.
- **Technological Trends:** Emerging technologies impacting CPS.
- **Future Prospects:** Predicting the future of CPS in the telecommunications industry.

35.10 CPS Case Studies in Telecommunications

Analyze real-world case studies where CPS has been effectively integrated into telecommunications systems.

Key Topics:

- **Case Studies:** Detailed analysis of successful CPS implementations.
- **Integration Strategies:** Understanding strategies for integrating CPS in telecom systems.
- **Lessons Learned:** Key takeaways from real-world CPS applications in telecommunications.

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36. Topics:

37. Master's Program in Artificial Intelligence and Machine Learning for Software Engineering

This course provides an in-depth exploration of artificial intelligence and machine learning within the context of software engineering. It is designed to equip students with the knowledge and practical skills required to implement AI/ML solutions efficiently within software applications. The course covers fundamental concepts, advanced techniques, and real-world applications of AI and ML, fostering the development and deployment of intelligent software systems.

4.1 .12.15..36.1.Introduction to Artificial Intelligence and Machine Learning

This topic covers the fundamental concepts, history, and evolution of AI and ML, providing a basis for understanding how these technologies are poised to revolutionize software engineering.

36.2.Data Preprocessing and Feature Engineering

This module focuses on preparing data for machine learning models, involving data cleaning, normalization, and transformation. Feature engineering techniques are also discussed to improve model performance.

36.3.Supervised Learning Techniques

Discover various supervised learning algorithms such as regression, decision trees, and neural networks, and learn how to apply them within software systems.

36.4.Unsupervised Learning and Clustering

Explore unsupervised learning methods, including clustering and dimensionality reduction, which are essential for extracting insights from unlabeled data.

36.5.Deep Learning and Neural Networks

This topic delves into the structure and function of neural networks, focusing on deep learning techniques crucial for advancements in AI and complex software solutions.

36.6.Natural Language Processing

Gain an understanding of techniques to process and analyze human language data, facilitating the creation of AI-driven software that can comprehend and interact with text.

36.7.AI/ML in Software Development Lifecycle

Learn how AI and ML can be integrated into different stages of software development, from requirement gathering to deployment, enhancing software quality and performance.

36.8.Ethical and Responsible AI

Address the ethical considerations and responsibilities in AI, focusing on issues such as bias,

36.8.Deployment and Scaling of AI Solutions

Learn the practical considerations and challenges of deploying and scaling AI/ML solutions in production environments, ensuring they meet performance and reliability standards.

37.1 Master's Program in Artificial Intelligence and Machine Learning for Software Engineering

This course provides an in-depth exploration of artificial intelligence and machine learning within the context of software engineering. It is designed to equip students with the knowledge and practical skills required to implement AI/ML solutions efficiently within software applications. The course covers fundamental concepts, advanced techniques, and real-world applications of AI and ML, fostering the development and deployment of intelligent software systems.

37.2 Introduction to Artificial Intelligence and Machine Learning

This topic covers the fundamental concepts, history, and evolution of AI and ML, providing a basis for understanding how these technologies are poised to revolutionize software engineering.

Key Topics:

- **Fundamental Concepts:** Basics of AI and ML, including key definitions and principles.
- **History and Evolution:** Tracing the development of AI and ML over time.
- **Impact on Software Engineering:** Understanding how AI and ML are transforming the field of software engineering.

37.3 Data Preprocessing and Feature Engineering

This module focuses on preparing data for machine learning models, involving data cleaning, normalization, and transformation. Feature engineering techniques are also discussed to improve model performance.

Key Topics:

- **Data Cleaning:** Techniques for handling missing values, outliers, and inconsistencies in data.
- **Normalization and Transformation:** Methods for scaling and transforming data for better model performance.
- **Feature Engineering:** Creating and selecting relevant features to enhance model accuracy.

37.4 Supervised Learning Techniques

Discover various supervised learning algorithms such as regression, decision trees, and neural networks, and learn how to apply them within software systems.

Key Topics:

- **Regression:** Linear and logistic regression techniques.
- **Decision Trees:** Understanding how decision trees work and their applications.
- **Neural Networks:** Basics of neural networks and how they can be used in supervised learning.

37.5 Unsupervised Learning and Clustering

Explore unsupervised learning methods, including clustering and dimensionality reduction, which are essential for extracting insights from unlabeled data.

Key Topics:

- **Clustering:** Techniques such as K-means, hierarchical clustering, and DBSCAN.
- **Dimensionality Reduction:** Methods like PCA (Principal Component Analysis) and t-SNE.
- **Applications:** Real-world applications of unsupervised learning in software systems.

37.6 Deep Learning and Neural Networks

This topic delves into the structure and function of neural networks, focusing on deep learning techniques crucial for advancements in AI and complex software solutions.

Key Topics:

- **Deep Learning:** Understanding deep learning architectures like CNNs (Convolutional Neural Networks) and RNNs (Recurrent Neural Networks).
- **Neural Network Structures:** Layers, activation functions, and backpropagation.
- **Advanced Techniques:** Exploring advanced topics such as transfer learning and generative adversarial networks (GANs).

37.7 Natural Language Processing

Gain an understanding of techniques to process and analyze human language data, facilitating the creation of AI-driven software that can comprehend and interact with text.

Key Topics:

- **Text Preprocessing:** Techniques for tokenization, stemming, and lemmatization.
- **NLP Models:** Understanding models like Word2Vec, BERT, and GPT.
- **Applications:** Implementing NLP in chatbots, sentiment analysis, and other applications.

37.8 AI/ML in Software Development Lifecycle

Learn how AI and ML can be integrated into different stages of software development, from requirement gathering to deployment, enhancing software quality and performance.

Key Topics:

- **Requirement Gathering:** Using AI for requirement analysis and specification.
- **Development:** Incorporating AI/ML algorithms into software development processes.

- **Testing:** Automated testing and bug detection using AI.
- **Deployment:** Best practices for deploying AI/ML solutions in production environments.

37.9 Ethical and Responsible AI

Address the ethical considerations and responsibilities in AI, focusing on issues such as bias, transparency, and accountability.

Key Topics:

- **Bias and Fairness:** Identifying and mitigating biases in AI models.
- **Transparency:** Ensuring transparency in AI decision-making processes.
- **Accountability:** Establishing accountability for AI outcomes and decisions.

37.10 Deployment and Scaling of AI Solutions

Learn the practical considerations and challenges of deploying and scaling AI/ML solutions in production environments, ensuring they meet performance and reliability standards.

Key Topics:

- **Deployment Challenges:** Overcoming challenges in deploying AI solutions.
- **Scaling Techniques:** Techniques for scaling AI/ML models to handle large volumes of data.
- **Performance Monitoring:** Ensuring ongoing performance and reliability of AI solutions.

These courses provide a comprehensive understanding of artificial intelligence and machine learning for software engineering, equipping students with the knowledge and skills to innovate and lead in this rapidly evolving field

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37..Topics:

4.1 .12.15.37.1.Advanced Studies in Autonomous Vehicles and Drones for Electric Vehicle Engineering

This course provides an in-depth exploration of the engineering principles and technological innovations driving autonomous vehicles and drones. Focused within the field of Electric Vehicle Engineering, the curriculum bridges the gap between hardware design, software development, and system integration to equip students with the skills to design, test, and refine autonomous systems.

37.1.Introduction to Autonomous Systems

An overview of autonomous vehicle and drone technologies, including historical development and future trends.

37.2Electric Vehicle Engineering Basics

Foundational concepts of electric vehicle engineering, including battery technology and electric motor design.

37.3.Sensor Technologies and Data Processing

Understanding the sensors used in autonomous systems, including LIDAR, RADAR, and cameras, as well as data processing algorithms.

37.4.Machine Learning and AI for Autonomous Systems

Exploration of machine learning and artificial intelligence applications in autonomous decision-making and navigation.

37.5.Communication Networks and IoT

Study of communication networks and the role of IoT in connecting autonomous vehicles and drones.

37.6.Control Systems for Autonomous Vehicles

Examination of control systems used for vehicle dynamics and operational management in autonomous vehicles.

37.7Ethical and Regulatory Aspects

Discussion on the ethical implications and regulatory challenges associated with the deployment of autonomous vehicles and drones.

37.8.Testing and Validation of Autonomous Systems

Processes involved in testing and validation methodologies to ensure the safety and reliability of autonomous systems.

37.9.Integration of Renewable Energy in Autonomous Systems

Integration of renewable energy sources like solar and wind power into autonomous systems to enhance sustainability.---

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37.1 Advanced Studies in Autonomous Vehicles and Drones for Electric Vehicle Engineering

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37.2 Introduction to Autonomous Systems

An overview of autonomous vehicle and drone technologies, including historical development and future trends.

Key Topics:

- **Historical Development:** Tracing the evolution of autonomous systems from inception to present day.
- **Technologies:** Key technologies driving autonomous vehicles and drones.
- **Future Trends:** Predicting the future advancements and trends in autonomous systems.

37.3 Electric Vehicle Engineering Basics

Foundational concepts of electric vehicle engineering, including battery technology and electric motor design.

Key Topics:

- **Battery Technology:** Understanding the types, design, and performance of batteries used in electric vehicles.
- **Electric Motor Design:** Basics of electric motor functionality and design.
- **Charging Systems:** Overview of charging infrastructure and technologies.

37.4 Sensor Technologies and Data Processing

Understanding the sensors used in autonomous systems, including LIDAR, RADAR, and cameras, as well as data processing algorithms.

Key Topics:

- **LIDAR and RADAR:** Functionality and applications in autonomous systems.
- **Cameras and Imaging:** Role of cameras in autonomous navigation and obstacle detection.
- **Data Processing Algorithms:** Techniques for processing and analyzing sensor data.

37.5 Machine Learning and AI for Autonomous Systems

Exploration of machine learning and artificial intelligence applications in autonomous decision-making and navigation.

Key Topics:

- **Machine Learning:** Applying ML algorithms for autonomous systems.
- **AI Decision-Making:** Implementing AI for navigation and obstacle avoidance.
- **Real-World Applications:** Case studies of AI and ML in autonomous vehicles and drones.

37.6 Communication Networks and IoT

Study of communication networks and the role of IoT in connecting autonomous vehicles and drones.

Key Topics:

- **Communication Protocols:** Understanding the protocols used in autonomous vehicle networks.
- **IoT Integration:** How IoT devices enhance connectivity in autonomous systems.
- **Network Security:** Ensuring secure communication in autonomous networks.

37.7 Control Systems for Autonomous Vehicles

Examination of control systems used for vehicle dynamics and operational management in autonomous vehicles.

Key Topics:

- **Vehicle Dynamics:** Basics of vehicle control and dynamics.
- **Control Algorithms:** Algorithms used for maintaining stability and control.
- **Operational Management:** Managing the operations of autonomous systems.

37.8 Ethical and Regulatory Aspects

Discussion on the ethical implications and regulatory challenges associated with the deployment of autonomous vehicles and drones.

Key Topics:

- **Ethical Considerations:** Addressing the ethical issues in autonomous system deployment.
- **Regulatory Frameworks:** Understanding the regulations governing autonomous vehicles and drones.
- **Compliance:** Ensuring compliance with legal and ethical standards.

37.9 Testing and Validation of Autonomous Systems

Processes involved in testing and validation methodologies to ensure the safety and reliability of autonomous systems.

Key Topics:

- **Testing Methodologies:** Techniques for testing autonomous systems.
- **Validation Processes:** Ensuring the reliability and safety of autonomous vehicles.
- **Case Studies:** Real-world examples of testing and validation.

37.10 Integration of Renewable Energy in Autonomous Systems

Investigating how renewable energy sources can be integrated into autonomous vehicles and drones to enhance sustainability.

Key Topics:

- **Renewable Energy Sources:** Types of renewable energy used in autonomous systems.
- **Integration Techniques:** Methods for integrating renewable energy into vehicle design.
- **Sustainability:** Promoting sustainable practices in autonomous vehicle engineering

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38.1.topics

4.1 .12.15.38.2:Specialist Engineering in Infrastructure and Contractors: Electrochemical Engineering

This Master’s degree course offers in-depth knowledge in electrochemical engineering within the realm of infrastructure and contractors. It is designed to equip students with the fundamental theories and practical skills necessary to tackle complex engineering projects involving electrochemical systems. From battery technologies to electrochemical processes, students will explore various applications and innovative solutions pertinent to sustainable infrastructure.

38.3.Introduction to Electrochemical Engineering

Understand the basic principles of electrochemistry, including thermodynamics and kinetics, electron transfer processes, and the design and operation of electrochemical systems.

38.4.Battery Technologies for Infrastructure

Explore the various types of battery technologies used in infrastructure, including lithium-ion, lead-acid, and emerging technologies such as solid-state batteries.

38.5.Fuel Cells and Their Applications

Study the principles and applications of different types of fuel cells, focusing on their role in providing clean energy for infrastructure projects.

38.6.and Its Prevention

Learn about the electrochemical processes involved in corrosion, methods of prevention, and materials selection to enhance infrastructure durability.

38.7..Electrochemical Sensors and Monitoring

Understand the design and function of electrochemical sensors in monitoring environmental conditions and structural health in infrastructure projects.

38.8.Electrolysis and Industrial Processes

Explore how electrolysis is used in various industrial processes, such as water splitting for hydrogen production and metal plating.

38.9.Sustainability and Electrochemical Engineering

Discuss the impact of electrochemical engineering on sustainable infrastructure development and the environment.

.38.10.Advanced Topics in Electrochemical Engineering

Delve into advanced topics and current research trends in electrochemical engineering, such as nanostructured materials and next-generation energy systems.

38.2 Specialist Engineering in Infrastructure and Contractors: Electrochemical Engineering

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38.3 Introduction to Electrochemical Engineering

Understand the basic principles of electrochemistry, including thermodynamics and kinetics, electron transfer processes, and the design and operation of electrochemical systems.

Key Topics:

- **Thermodynamics and Kinetics:** Fundamental principles governing electrochemical reactions.
- **Electron Transfer Processes:** Mechanisms of electron transfer in electrochemical systems.
- **System Design and Operation:** Designing and operating efficient electrochemical systems.

38.4 Battery Technologies for Infrastructure

Explore the various types of battery technologies used in infrastructure, including lithium-ion, lead-acid, and emerging technologies such as solid-state batteries.

Key Topics:

- **Lithium-ion Batteries:** Structure, function, and applications.
- **Lead-acid Batteries:** Traditional uses and modern improvements.
- **Emerging Technologies:** Exploring the potential of solid-state and other advanced battery technologies.

38.5 Fuel Cells and Their Applications

Study the principles and applications of different types of fuel cells, focusing on their role in providing clean energy for infrastructure projects.

Key Topics:

- **Types of Fuel Cells:** Proton exchange membrane (PEM), solid oxide (SOFC), and others.
- **Clean Energy Production:** How fuel cells contribute to sustainable energy solutions.
- **Infrastructure Applications:** Real-world applications of fuel cells in infrastructure projects.

38.6 Corrosion and Its Prevention

Learn about the electrochemical processes involved in corrosion, methods of prevention, and materials selection to enhance infrastructure durability.

Key Topics:

- **Corrosion Mechanisms:** Understanding how and why corrosion occurs.
- **Prevention Methods:** Techniques to prevent and control corrosion.
- **Materials Selection:** Choosing materials to enhance durability and prevent corrosion.

38.7 Electrochemical Sensors and Monitoring

Understand the design and function of electrochemical sensors in monitoring environmental conditions and structural health in infrastructure projects.

Key Topics:

- **Sensor Design:** Principles of designing effective electrochemical sensors.
- **Environmental Monitoring:** Using sensors to monitor environmental conditions.
- **Structural Health Monitoring:** Applications in assessing the health and integrity of infrastructure.

38.8 Electrolysis and Industrial Processes

Explore how electrolysis is used in various industrial processes, such as water splitting for hydrogen production and metal plating.

Key Topics:

- **Electrolysis Basics:** Understanding the principles of electrolysis.
- **Hydrogen Production:** Using electrolysis for sustainable hydrogen generation.
- **Industrial Applications:** Applying electrolysis in metal plating and other industrial processes.

38.9 Sustainability and Electrochemical Engineering

Discuss the impact of electrochemical engineering on sustainable infrastructure development and the environment.

Key Topics:

- **Sustainability Principles:** Integrating sustainability into electrochemical engineering practices.
- **Environmental Impact:** Assessing and mitigating the environmental impact of electrochemical processes.
- **Sustainable Development:** Promoting sustainable infrastructure through innovative electrochemical solutions.

38.10 Advanced Topics in Electrochemical Engineering

Delve into advanced topics and current research trends in electrochemical engineering, such as nanostructured materials and next-generation energy systems.

Key Topics:

- **Nanostructured Materials:** Exploring the role of nanotechnology in electrochemical engineering.
- **Next-Generation Energy Systems:** Innovations in energy systems for sustainable infrastructure.

- **Current Research Trends:** Investigating the latest advancements and research in the field.

These courses provide a comprehensive understanding of electrochemical engineering in infrastructure and contractors, equipping students with the knowledge and skills to tackle complex engineering projects and promote sustainable developme

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40.Topics

4.1 .12.15..40.1Topics:Energy Storage and Battery Technology

This course explores advanced concepts in energy storage with a focus on battery technologies, essential for the integration of renewable energy sources. Students will gain an in-depth understanding of various energy storage systems, their applications, and the technological advancements driving the sector. The course is designed for graduate students in the Master's program in renewable energy, providing both theoretical knowledge and practical insights.

40.2.Introduction to Energy Storage Systems

An overview of energy storage technologies and their importance in the modern energy landscape.

40.3.Battery Chemistry and Physics

Understanding the fundamental principles of various battery chemistries, including lithium-ion, lead-acid, and emerging technologies.

40.4.Design and Functionality of Battery Cells

Exploration of the design and operational principles of individual battery cells, and how they combine to form larger battery systems.

40.5.Applications of Battery Storage

Examine how battery storage is used in various sectors such as electric vehicles, grid storage, and portable electronics.

40.6.Efficiency and Performance Measurements

Learn about the metrics used to measure the performance and efficiency of battery systems.

40.7.Safety and Environmental Impacts

Discussion of the safety protocols for batteries and their environmental impact, including recycling and waste management.

40.8.Advanced Energy Storage Technologies

Explore cutting-edge advancements in energy storage beyond current battery technology, such as supercapacitors and flow batteries.

40.9.Policy and Economics of Energy Storage

Examine the economic impacts, policy considerations, and market dynamics of implementing energy storage solutions.

40.10.Future Trends in Battery Technology

Insights into the future direction of battery technology research and its role in achieving a sustainable energy future.

41.1.Topics:

41.2.Advanced Robotic Process Automation in Electrical Engineering

This course aims to equip students with advanced knowledge and practical skills in implementing Robotic Process Automation (RPA) within the field of Electrical Engineering. The curriculum addresses the integration of RPA technologies to streamline and optimize engineering processes, focusing on automating complex electrical engineering tasks.

41.3.Introduction to Robotic Process Automation

An overview of RPA, its significance in the industry, and its application in electrical engineering.

41.4.RPA Tools and Technologies

Explore popular RPA tools like UiPath, Automation Anywhere, and Blue Prism and their specific applications in engineering.

41.5.Automating Electrical Design Processes

Learn how to automate repetitive tasks in electrical design using RPA to increase efficiency and reduce human error.

41.6.Data Migration and Management

Understanding the role of RPA in handling data migration and management in electrical engineering projects.

41.7.RPA in Control Systems

Applications of RPA in the automation of control systems and simulation processes within electrical engineering.

41.8.Machine Learning and RPA

Integrating machine learning with RPA for enhanced decision-making and predictive maintenance in electrical engineering.

41.9.RPA and IoT in Electrical Systems

Exploring the synergy between RPA and IoT to develop smart electrical systems with improved functionality and efficiency.

41.10.Security and Ethics in RPA

Understanding the ethical considerations and security challenges associated with the deployment of RPA in electrical engineering.

1.2 Advanced Robotic Process Automation in Electrical Engineering

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41.3 Introduction to Robotic Process Automation

An overview of RPA, its significance in the industry, and its application in electrical engineering.

Key Topics:

- **RPA Basics:** Understanding the fundamentals of Robotic Process Automation.
- **Industry Significance:** Exploring the importance and impact of RPA in various industries.
- **Applications in Electrical Engineering:** Specific use cases and benefits of RPA in electrical engineering.

41.4 RPA Tools and Technologies

Explore popular RPA tools like UiPath, Automation Anywhere, and Blue Prism and their specific applications in engineering.

Key Topics:

- **UiPath:** Features and applications of UiPath in automating engineering tasks.
- **Automation Anywhere:** Understanding how Automation Anywhere can be used in electrical engineering.
- **Blue Prism:** Exploring Blue Prism's capabilities and use cases in the industry.

41.5 Automating Electrical Design Processes

Learn how to automate repetitive tasks in electrical design using RPA to increase efficiency and reduce human error.

Key Topics:

- **Repetitive Task Automation:** Identifying and automating repetitive tasks in electrical design.
- **Efficiency Improvement:** Enhancing efficiency and productivity through automation.
- **Error Reduction:** Minimizing human errors by implementing RPA solutions.

41.6 Data Migration and Management

Understanding the role of RPA in handling data migration and management in electrical engineering projects.

Key Topics:

- **Data Migration:** Techniques for automating data migration processes.
- **Data Management:** Using RPA to manage and organize large datasets.
- **Project Applications:** Implementing RPA for data handling in engineering projects.

41.7 RPA in Control Systems

Applications of RPA in the automation of control systems and simulation processes within electrical engineering.

Key Topics:

- **Control Systems Automation:** Using RPA to automate control system processes.
- **Simulation Processes:** Enhancing simulation processes through automation.
- **Case Studies:** Real-world examples of RPA applications in control systems.

41.8 Machine Learning and RPA

Integrating machine learning with RPA for enhanced decision-making and predictive maintenance in electrical engineering.

Key Topics:

- **Machine Learning Integration:** Combining ML algorithms with RPA for advanced automation.
- **Predictive Maintenance:** Using ML and RPA for proactive maintenance strategies.
- **Enhanced Decision-Making:** Improving decision-making processes through intelligent automation.

41.9 RPA and IoT in Electrical Systems

Exploring the synergy between RPA and IoT to develop smart electrical systems with improved functionality and efficiency.

Key Topics:

- **RPA and IoT Integration:** Understanding how RPA and IoT can work together.
- **Smart Systems:** Developing smart electrical systems using RPA and IoT.
- **Efficiency and Functionality:** Enhancing system functionality and efficiency through integration.

41.10 Security and Ethics in RPA

Understanding the ethical considerations and security challenges associated with the deployment of RPA in electrical engineering.

Key Topics:

- **Ethical Considerations:** Addressing ethical issues in RPA implementation.
- **Security Challenges:** Identifying and mitigating security risks in RPA systems.
- **Best Practices:** Implementing best practices for secure and ethical RPA deployment.

These courses provide a comprehensive understanding of advanced robotic process automation in electrical engineering, equipping students with the knowledge and skills to innovate and lead in this field.

44…Topics grand circulum summarise resolve probme outcome exercise :

44.1 reating a comprehensive and accurate calculation formulation for a master's degree in electrical engineering typically involves several steps. These can vary depending on the specific topic or project you are working on. Here, I'll outline a general approach to developing a calculation formulation in the context of electrical engineering:

44..1. Define the Problem

- Clearly state the engineering problem or objective.
- Identify the variables and parameters involved.
- Determine the constraints and assumptions.

2. Develop the Mathematical Model

- Formulate the equations governing the physical system (e.g., Ohm's law, Kirchhoff's laws, Maxwell's equations).
- Use appropriate mathematical techniques to model the system (e.g., differential equations, linear algebra).

3. Simplify the Equations

- Apply any necessary simplifications or approximations.
- Reduce the equations to a solvable form.

4. Analytical Solution (if possible)

- Solve the equations analytically using mathematical methods.
- Check the validity of the analytical solution within the defined constraints.

5. Numerical Solution (if necessary)

- If the analytical solution is not feasible, develop a numerical solution.
- Use numerical methods (e.g., finite element method, numerical integration).

6. Simulation and Validation

- Implement the model in simulation software (e.g., MATLAB, Simulink).
- Validate the results with experimental data or known benchmarks.

7. Optimization (if applicable)

- Optimize the solution for desired performance criteria (e.g., efficiency, cost).
- Use optimization techniques (e.g., genetic algorithms, gradient descent).

Example Calculation: Load Flow Analysis in Power Systems

Here's a simplified example of a calculation formulation for load flow analysis in power systems:

Step 1: Define the Problem

- Objective: Determine the voltage and phase angle at each bus in the power system.
- Variables: Bus voltages (V), phase angles (θ), real power (P), reactive power (Q).
- Constraints: Power balance equations, voltage limits.

Step 2: Develop the Mathematical Model

- Use the power flow equations: $$P_i = V_i \sum_{j=1}^{n} V_j (G_{ij} \cos \theta_{ij} + B_{ij} \sin \theta_{ij})$$ $$Q_i = V_i \sum_{j=1}^{n} V_j (G_{ij} \sin \theta_{ij} - B_{ij} \cos \theta_{ij})$$ Where GijG_{ij} and BijB_{ij} are the conductance and susceptance of the transmission line between buses ii and jj.

Step 3: Simplify the Equations

- Apply any necessary assumptions (e.g., flat start method with initial voltage guesses).

Step 4: Analytical Solution

- Not feasible for large power systems.

Step 5: Numerical Solution

- Use the Newton-Raphson method to solve the power flow equations iteratively.

Step 6: Simulation and Validation

- Implement the Newton-Raphson method in MATLAB.

- Validate the results with a test power system.

Step 7: Optimization

- Optimize the power flow to minimize losses or improve voltage stability.

By following these steps, you can create a robust and accurate calculation formulation for various electrical engineering problems. If you need help with a specific calculation or further details on any step, feel free to ask!

Electrical engineering encompasses a wide range of topics that involve various calculations. Here are some common areas and the types of calculations typically associated with them:

1. Circuit Analysis

- **Ohm's Law:** V=IRV = IR
- **Power Calculations:** P=VIP = VI, P=I2RP = I^2R
- **Kirchhoff's Laws:** Kirchhoff's Voltage Law (KVL) and Kirchhoff's Current Law (KCL)
- **Impedance and Reactance:** Calculating the impedance (ZZ) of AC circuits, inductive reactance (XL=2πfLX_L = 2\pi fL), and capacitive reactance (XC=12πfCX_C = \frac{1}{2\pi fC})

2. Electromagnetics

- **Coulomb's Law:** F=keq1q2r2F = k_e \frac{q_1 q_2}{r^2}
- **Electric Field Calculations:** E=FqE = \frac{F}{q}
- **Magnetic Field Calculations:** Using Biot-Savart Law and Ampère's Law

3. Signal Processing

- **Fourier Transforms:** Transforming signals from time domain to frequency domain
- **Laplace Transforms:** For analyzing linear time-invariant systems

- **Z-Transforms:** Used in digital signal processing for discrete-time signals

4. Control Systems

- **Transfer Functions:** $H(s)=Y(s)X(s)H(s) = \frac{Y(s)}{X(s)}$
- **Stability Analysis:** Using Routh-Hurwitz criterion, Nyquist criterion, and Bode plots
- **PID Controller Tuning:** Calculations for proportional, integral, and derivative gains

5. Power Systems

- **Load Flow Analysis:** Solving the power flow equations using methods like Newton-Raphson or Gauss-Seidel
- **Short Circuit Calculations:** Determining the fault current levels in a power system
- **Power Factor Correction:** Calculations to improve the power factor of electrical loads

6. Electronics

- **Transistor Biasing:** Calculations for setting the operating point of transistors
- **Amplifier Design:** Gain and bandwidth calculations for different types of amplifiers
- **Oscillator Design:** Frequency and stability calculations for oscillators

7. Digital Systems

- **Logic Gates and Boolean Algebra:** Simplifying Boolean expressions
- **Flip-Flops and Counters:** Timing and state analysis
- **Digital Signal Processing:** Sampling, quantization, and digital filter design

8. Communication Systems

- **Modulation Techniques:** Calculations for AM, FM, and PM systems
- **Signal-to-Noise Ratio (SNR):** Calculating the quality of a signal
- **Bandwidth Calculations:** Determining the bandwidth requirements for various modulation schemes

9. Renewable Energy Systems

- **Solar Panel Calculations:** Determining the power output and efficiency of solar panels
- **Wind Turbine Calculations:** Analyzing the power generation capabilities of wind turbines
- **Battery Storage:** Calculations for energy storage capacity and efficiency

These topics and their associated calculations are fundamental to various fields within electrical engineering. If you need specific examples or more detailed explanations for any of these areas, feel free to ask!

1. Circuit Analysis

- **Ohm's Law and Power Calculations:** Used in designing electrical circuits for consumer electronics, industrial machinery, and power distribution systems. Engineers calculate the appropriate resistance, current, and voltage to ensure safe and efficient operation.
- **Kirchhoff's Laws:** Applied in the design and troubleshooting of complex electrical networks, such as those in automotive systems and aerospace engineering. These laws help ensure that all electrical parameters are balanced and within safe limits.

2. Electromagnetics

- **Magnetic Field Calculations:** Utilized in the design of electric motors, transformers, and inductors. These calculations help engineers optimize the magnetic field strength and minimize energy losses.
- **Antenna Design:** Engineers use electromagnetic theory to design antennas for telecommunications, including mobile phones, satellite communication, and radar systems, ensuring optimal signal strength and coverage.

3. Signal Processing

- **Fourier Transforms:** Employed in the analysis and design of communication systems, such as modems, to convert signals between time and frequency domains. This is crucial for filtering, modulation, and noise reduction.

- **Digital Signal Processing (DSP):** Used in audio and image processing applications, including noise cancellation in headphones, speech recognition systems, and medical imaging devices.

4. Control Systems

- **Stability Analysis:** Applied in the design of control systems for various applications, such as robotics, automotive cruise control, and industrial automation. Engineers ensure that the system remains stable under different operating conditions.

- **PID Controller Tuning:** Essential for maintaining precise control in processes like temperature regulation in HVAC systems, speed control in electric motors, and pressure control in chemical plants.

5. Power Systems

- **Load Flow Analysis:** Critical for the planning and operation of electrical power grids. Engineers use load flow studies to determine the best configuration of the network to ensure reliable power delivery and minimize losses.

- **Short Circuit Calculations:** Used to design protective devices like circuit breakers and fuses, ensuring the safety of power systems during fault conditions.

6. Electronics

- **Transistor Biasing:** Ensures that transistors operate correctly within amplifiers and switching circuits. This is vital in designing everything from audio amplifiers to digital logic circuits.

- **Amplifier Design:** Calculations help determine the gain, bandwidth, and stability of amplifiers used in audio equipment, communication systems, and medical devices.

7. Digital Systems

- **Logic Gates and Boolean Algebra:** Fundamental in the design of digital circuits and microprocessors. Engineers use these calculations to create efficient and reliable digital systems for computers, smartphones, and embedded systems.

- **Flip-Flops and Counters:** Used in the design of memory elements and timing circuits, essential for data storage and processing in digital electronics.

8. Communication Systems

- **Modulation Techniques:** Applied in the design of wireless communication systems, such as radio, television, and mobile networks. Engineers calculate modulation parameters to ensure efficient and clear transmission of signals.

- **Bandwidth Calculations:** Determine the required bandwidth for different communication channels, ensuring optimal use of the frequency spectrum.

9. Renewable Energy Systems

- **Solar Panel Calculations:** Used to design and optimize solar power systems for residential, commercial, and utility-scale applications. Engineers calculate the number of panels, their orientation, and energy output.

- **Wind Turbine Calculations:** Help determine the optimal placement, size, and design of wind turbines to maximize energy production and minimize environmental impact.

These calculations are fundamental to ensuring that electrical engineering projects are efficient, safe, and reliable. They enable engineers to innovate and develop solutions that meet the needs of modern society. If you have any specific area or project in mind, I can provide more detailed examples of how calculations are applied!

. Circuit Design and Analysis

- **Consumer Electronics:** Engineers use Ohm's Law, Kirchhoff's Laws, and power calculations to design and analyze circuits in devices like smartphones, laptops, and home appliances. These calculations ensure that the circuits function correctly and safely.

- **Automotive Electronics:** In automotive engineering, circuit analysis ensures that electronic control units (ECUs) and other electronic components operate reliably, improving vehicle safety and performance.

2. Power Systems Engineering

- **Power Grid Management:** Load flow analysis is used to plan and operate electrical power grids, ensuring efficient power distribution and stability. Engineers use this to design new power plants and optimize the existing grid to handle varying load demands.

- **Renewable Energy Integration:** Short circuit calculations and power factor correction are crucial when integrating renewable energy sources like solar panels and wind turbines into the power grid. These calculations ensure that the system can handle new power sources without compromising stability.

3. Control Systems

- **Industrial Automation:** Engineers apply control system calculations to design and optimize automated manufacturing processes. For example, PID controllers are used to regulate temperature, pressure, and other variables in chemical plants and manufacturing lines.

- **Robotics:** Control systems calculations are essential for designing and tuning the control algorithms that allow robots to perform precise movements and tasks, such as assembly line work or medical surgeries.

4. Communication Systems

- **Telecommunications:** Engineers use modulation and bandwidth calculations to design and optimize communication systems, ensuring clear and efficient signal transmission. This is essential for mobile networks, satellite communications, and internet services.

- **Signal Processing:** Fourier transforms and digital signal processing (DSP) techniques are used to filter and enhance audio and video signals in applications like broadcasting, video conferencing, and speech recognition.

5. Electronics and Semiconductor Design

- **Integrated Circuit Design:** Engineers use transistor biasing and amplifier design calculations to develop integrated circuits (ICs) used in various electronic devices. These calculations ensure that ICs operate efficiently and reliably.

- **Sensor Development:** Calculations related to impedance and reactance are used in designing sensors for applications like medical devices, environmental monitoring, and industrial automation.

6. Renewable Energy Systems

- **Solar Power Systems:** Engineers perform solar panel calculations to design and optimize solar power installations, ensuring maximum energy generation and efficiency. This includes determining the optimal tilt angle, orientation, and panel configuration.

- **Wind Energy Projects:** Wind turbine calculations help determine the best locations, sizes, and designs for wind turbines to maximize energy production and minimize environmental impact.

7. Building and Infrastructure

- **Smart Buildings:** Engineers use IoT and control systems calculations to design smart building systems that optimize energy usage, enhance security, and improve occupant comfort. This includes designing HVAC systems, lighting controls, and security systems.

- **Transportation Infrastructure:** Calculations related to power distribution, signal processing, and control systems are used in designing and maintaining transportation infrastructure like railways, airports, and traffic management systems.

8. Biomedical Engineering

- **Medical Devices:** Engineers use signal processing and control system calculations to develop medical devices such as MRI machines, pacemakers, and automated insulin pumps. These calculations ensure accurate and reliable operation of medical equipment.

- **Wearable Technology:** Calculations for power efficiency and signal processing are essential in designing wearable health monitoring devices that track vital signs and provide real-time health data.

These examples highlight the critical role of electrical engineering calculations in ensuring the efficiency, safety, and reliability of various

systems and technologies in real-world engineering projects. If you have a specific project or area in mind, I can provide more detailed examples or explanations.

To resolve calculations related to a Master's program in Electrical Engineering with a focus on communication and information systems, we can look at some common topics and the typical calculations involved in those areas. Here's a breakdown:

1. Signal Processing

- **Fourier Transforms and Spectral Analysis**
    - Calculate the Fourier transform X(f)X(f) of a time-domain signal x(t)x(t): $$X(f) = \int_{-\infty}^{\infty} x(t)e^{-j2\pi ft} dt$$
    - Use spectral analysis to identify frequency components and bandwidth.
- **Filter Design**
    - Design digital filters using the Z-transform and filter specifications (e.g., cutoff frequency, filter order): $$H(z) = \frac{b_0 + b_1z^{-1} + \cdots + b_Mz^{-M}}{1 + a_1z^{-1} + \cdots + a_Nz^{-N}}$$
    - Analyze filter response and stability.

2. Communication Systems

- **Modulation and Demodulation**
    - Calculate modulation index mm for amplitude modulation (AM): $$m = \frac{A_m}{A_c}$$ where AmA_m is the amplitude of the message signal and AcA_c is the amplitude of the carrier signal.
    - Determine the bandwidth of frequency-modulated (FM) signals using Carson's rule: $$BW = 2(\Delta f + f_m)$$ where Δf\Delta f is the frequency deviation and fmf_m is the maximum modulating frequency.
- **Signal-to-Noise Ratio (SNR)**

- Calculate the SNR for a communication system: $$\text{SNR} = 10 \log_{10}\left(\frac{P_{signal}}{P_{noise}}\right)$$ where PsignalP_{signal} is the power of the signal and PnoiseP_{noise} is the power of the noise.

3. Information Theory

- **Entropy and Information Content**
  - Calculate the entropy H(X)H(X) of a discrete random variable XX: $$H(X) = -\sum_{i} P(x_i) \log_2 P(x_i)$$ where P(xi)P(x_i) is the probability of the ii-th outcome.
- **Channel Capacity**
  - Determine the channel capacity CC using the Shannon-Hartley theorem: $$C = B \log_2 \left(1 + \frac{S}{N}\right)$$ where BB is the bandwidth of the channel, SS is the signal power, and NN is the noise power.

4. Network Theory

- **Network Topologies and Protocols**
  - Analyze network performance metrics such as latency, throughput, and packet loss for different topologies (e.g., star, mesh).
  - Use queuing theory to model and evaluate network performance.

5. Electromagnetic Theory

- **Maxwell's Equations**
  - Apply Maxwell's equations to solve for electric and magnetic fields in communication systems: $$\nabla \cdot \mathbf{E} = \frac{\rho}{\epsilon_0}$$ $$\nabla \cdot \mathbf{B} = 0$$ $$\nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t}$$ $$\nabla \times \mathbf{B} = \mu_0 \mathbf{J} + \mu_0 \epsilon_0 \frac{\partial \mathbf{E}}{\partial t}$$

6. Digital Communication

- **Error Detection and Correction**

- Calculate the Hamming distance and error-detecting/correcting capabilities of codes.
- Use cyclic redundancy check (CRC) to detect errors in transmitted dat

1. Signal Processing

- **Fourier Transforms and Spectral Analysis:**
  - Used to convert time-domain signals to frequency-domain representations for analyzing and filtering signals. For example, Fourier transforms are used in OFDM (Orthogonal Frequency Division Multiplexing) systems in 4G and 5G networks to enable efficient data transmission.
- **Filter Design:**
  - Digital filters are designed using Z-transforms to remove noise and interference from signals. This is crucial in audio and video streaming services to ensure clear and high-quality transmission.

2. Communication Systems

- **Modulation and Demodulation:**
  - Modulation techniques like QAM (Quadrature Amplitude Modulation) and PSK (Phase Shift Keying) are used in transmitting data over various communication channels. Calculations for modulation index and bandwidth are critical in maximizing data rates while minimizing interference.
- **Signal-to-Noise Ratio (SNR):**
  - SNR calculations are used to assess the quality of received signals. High SNR is essential for maintaining clear communication in wireless networks, satellite communications, and broadcasting.

3. Information Theory

- **Entropy and Information Content:**

- Calculations of entropy help in designing efficient coding schemes, such as Huffman coding and Shannon-Fano coding, which are used in data compression algorithms to reduce the amount of data transmitted.

- **Channel Capacity:**

  - Determining the channel capacity helps in optimizing the usage of available bandwidth. This is vital in designing systems like DSL (Digital Subscriber Line) and fiber-optic communication to achieve high data rates.

4. Network Theory

- **Network Topologies and Protocols:**

  - Performance metrics such as latency, throughput, and packet loss are calculated to design and optimize network topologies. For example, in Wi-Fi networks, these metrics ensure efficient data transmission and minimal delays.

5. Electromagnetic Theory

- **Maxwell's Equations:**

  - Applied to design and analyze antennas and propagation models in wireless communication. Engineers use these calculations to ensure optimal signal strength and coverage in cellular networks, GPS, and satellite communications.

6. Digital Communication

- **Error Detection and Correction:**

  - Error-detecting and correcting codes like Hamming codes and Reed-Solomon codes are calculated and implemented to ensure data integrity during transmission. These are widely used in storage devices, CDs/DVDs, and data transmission systems.

Practical Examples:

Mobile Networks (4G/5G)

- **OFDM:** Fourier transforms are used to split data into multiple frequency bands, allowing simultaneous data transmission and improving spectral efficiency.

- **MIMO (Multiple Input Multiple Output):** SNR and channel capacity calculations optimize the use of multiple antennas, enhancing data rates and signal quality.

Satellite Communication

- **Link Budget Analysis:** Calculations for SNR, modulation schemes, and error correction ensure reliable communication links between satellites and ground stations.

- **Doppler Shift Compensation:** Calculations are used to adjust for frequency shifts due to the relative motion of satellites and receivers.

Optical Fiber Communication

- **Wavelength-Division Multiplexing (WDM):** Spectral analysis ensures multiple data streams are transmitted simultaneously over different wavelengths, maximizing bandwidth.

- **Dispersion Management:** Calculations for dispersion compensate for signal spreading in the fiber, maintaining signal integrity over long distances.

IoT (Internet of Things)

- **Power Efficiency Calculations:** Ensuring low power consumption in IoT devices through efficient modulation schemes and data transmission protocols.

- **Network Scaling:** Calculations for network capacity and data flow ensure seamless connectivity and communication between a large number of IoT devices.

These calculations are vital for the successful implementation and optimization of modern communication systems, enabling high-speed, reliable, and efficient communication across various platforms and technologies. If you have a specific communication system or technology in mind, I can provide more detailed examples of how calculations are applied.

Solar Power Systems

Calculations for designing and optimizing solar power installations:

1. Solar Panel Output Calculation

- **Formula:** $$ P = A \times G \times \eta $$ Where:
  - PP is the power output (Watts)
  - AA is the area of the solar panel (square meters)
  - GG is the solar irradiance (Watts per square meter)
  - η\eta is the efficiency of the solar panel

2. Optimal Tilt Angle Calculation

- **Formula:**
  - For fixed solar panels: $$ \theta_{opt} = \text{Latitude} \pm 15^\circ $$
  - Adjust based on seasonal changes:
    - **Winter:** θopt=Latitude+15∘\theta_{opt} = \text{Latitude} + 15^\circ
    - **Summer:** θopt=Latitude−15∘\theta_{opt} = \text{Latitude} - 15^\circ

3. Orientation Calculation

- **Formula:**
  - The optimal orientation for solar panels in the Northern Hemisphere is true south, while in the Southern Hemisphere, it is true north.
  - **Azimuth Angle:** $$ \gamma = 180^\circ \text{ (South) or } 0^\circ \text{ (North)} $$
  - Adjustments might be necessary depending on local shading and obstacles.

4. Panel Configuration Calculation

- **Series and Parallel Connections:**

- **Series:** Voltage adds up, current remains the same. $$ V_{total} = \sum_{i=1}^{n} V_i $$
- **Parallel:** Current adds up, voltage remains the same. $$ I_{total} = \sum_{i=1}^{n} I_i $$

Wind Energy Projects

Calculations for optimizing wind turbine installations:

1. Power Output Calculation

- **Formula:** $$ P = \frac{1}{2} \rho A v^3 \eta $$ Where:
  - PP is the power output (Watts)
  - ρ\rho is the air density (kg/m³)
  - AA is the swept area of the turbine blades (m²)
  - vv is the wind speed (m/s)
  - η\eta is the efficiency of the turbine

2. Optimal Location Calculation

- **Formula:**
  - **Capacity Factor:** Average power generated divided by the rated peak power. $$ \text{Capacity Factor} = \frac{\text{Average Power Output}}{\text{Rated Peak Power}} $$
  - Areas with higher average wind speeds are preferred. Use wind resource maps and data.

3. Turbine Size and Design Calculation

- **Formula:**
  - **Rotor Diameter:** $$ D = 2 \sqrt{\frac{A}{\pi}} $$
  - Where DD is the rotor diameter and AA is the swept area.

4. Environmental Impact Calculation

- **Formula:**

    - **Noise Level:** Calculate expected noise levels at various distances. $$ L = L_0 - 20 \log_{10}(d) $$

    - Where LL is the noise level at distance dd from the source, and L0L_0 is the noise level at the reference distance.

These calculations are integral to ensuring that renewable energy systems are both efficient and environmentally friendly. If

1. Fourier Transforms and Spectral Analysis

Fourier transforms are crucial for converting time-domain signals to frequency-domain representations. This is essential for analyzing and filtering signals, particularly in applications like OFDM (Orthogonal Frequency Division Multiplexing) used in 4G and 5G networks.

Fourier Transform:

- **Definition:** $$ X(f) = \int_{-\infty}^{\infty} x(t) e^{-j2\pi ft} dt $$ Where:
    - X(f)X(f) is the frequency-domain representation of the signal.
    - x(t)x(t) is the time-domain signal.
    - jj is the imaginary unit.
    - ff is the frequency.
- **Inverse Fourier Transform:** $$ x(t) = \int_{-\infty}^{\infty} X(f) e^{j2\pi ft} df $$

Example - OFDM:

- In OFDM, multiple carriers are modulated with the data stream, and Fourier transforms are used to multiplex and demultiplex the carriers efficiently.
- **Calculations:** Transform the data from the time domain to the frequency domain before transmission and back to the time domain upon reception, using the FFT (Fast Fourier Transform) algorithm.

2. Filter Design

Digital filters are designed using Z-transforms to remove noise and interference from signals, ensuring clear and high-quality transmission in audio and video streaming services.

Z-Transform:

- **Definition:** $$ H(z) = \frac{Y(z)}{X(z)} $$ Where:
    - H(z)H(z) is the transfer function of the digital filter.
    - Y(z)Y(z) is the Z-transform of the output signal.
    - X(z)X(z) is the Z-transform of the input signal.

Example - FIR Filter:

- **FIR (Finite Impulse Response) Filter Design:** $$ H(z) = \sum_{k=0}^{N-1} h[k] z^{-k} $$ Where h[k]h[k] are the filter coefficients.
- **Design Steps:**
    1. Specify the desired frequency response.
    2. Determine the filter order NN.
    3. Calculate the filter coefficients h[k]h[k].

Communication Systems Calculations

Modulation and Demodulation

Modulation techniques like QAM (Quadrature Amplitude Modulation) and PSK (Phase Shift Keying) are used to transmit data over communication channels efficiently.

Quadrature Amplitude Modulation (QAM):

- **Formula:** $$ s(t) = I(t) \cos(2 \pi f_c t) - Q(t) \sin(2 \pi f_c t) $$ Where:
    - I(t)I(t) and Q(t)Q(t) are the in-phase and quadrature components of the signal.
    - fcf_c is the carrier frequency.

Phase Shift Keying (PSK):

- **Formula:** $$ s(t) = \cos(2 \pi f_c t + \theta) $$ Where:
    - θ\theta is the phase shift representing the data.

Example - QAM Modulation:

- **Steps:**
    1. Map the input data to QAM symbols.
    2. Generate the modulated signal using the QAM formula.

Example - PSK Modulation:

- **Steps:**
    1. Map the input data to phase shifts.
    2. Generate the modulated signal using the PSK form

1. MIMO (Multiple Input Multiple Output) Systems

SNR (Signal-to-Noise Ratio) Calculation:

- **Definition:** SNR is the ratio of the power of the signal to the power of the background noise.
- **Formula:** $$ \text{SNR} = \frac{P_{signal}}{P_{noise}} $$
    - In decibels (dB): $$ \text{SNR}*{dB} = 10 \log*{10}\left(\frac{P_{signal}}{P_{noise}}\right) $$

Channel Capacity Calculation:

- **Shannon-Hartley Theorem:** $$ C = M \cdot B \cdot \log_2 (1 + \text{SNR}) $$ Where:
    - CC is the channel capacity (bps)
    - MM is the number of antennas
    - BB is the bandwidth (Hz)
    - SNR\text{SNR} is the Signal-to-Noise Ratio

2. Satellite Communication

Link Budget Analysis:

- **Definition:** A link budget accounts for all gains and losses from the transmitter, through the medium, to the receiver in a telecommunication system.
- **Formula:** $$ P_{r} = P_{t} + G_{t} + G_{r} - L_{p} - L_{s} - L_{m} $$ Where:
    - PrP_{r} is the received power (dBm)
    - PtP_{t} is the transmitted power (dBm)
    - GtG_{t} is the transmitter antenna gain (dBi)
    - GrG_{r} is the receiver antenna gain (dBi)
    - LpL_{p} is the free-space path loss (dB)
    - LsL_{s} is the system losses (dB)
    - LmL_{m} is the miscellaneous losses (dB)

Doppler Shift Compensation:

- **Definition:** Doppler shift is the change in frequency of a wave in relation to an observer moving relative to the source of the wave.
- **Formula:** $$ f_d = \frac{v}{c} f_s $$ Where:
    - fdf_d is the Doppler shift
    - vv is the relative velocity between the source and observer
    - cc is the speed of light
    - fsf_s is the source frequency

3. Optical Fiber Communication

Wavelength-Division Multiplexing (WDM):

- **Spectral Analysis:**

    - **Fourier Transform:** $$ X(f) = \int_{-\infty}^{\infty} x(t) e^{-j2\pi ft} dt $$

Dispersion Management:

- **Definition:** Dispersion in optical fibers causes pulse spreading, reducing signal quality over long distances.
- **Formula:** $$ D = \frac{d\tau}{d\lambda} = \frac{d^{2\beta}{d\lambda^2} $$ Where:
    - DD is the dispersion parameter
    - τ\tau is the pulse broadening
    - λ\lambda is the wavelength
    - β\beta is the propagation constant

4. IoT (Internet of Things)

Power Efficiency Calculations:

- **Definition:** Ensuring low power consumption in IoT devices.
- **Formula:**
    - **Energy Consumption:** $$ E = P \times t $$ Where:
    - EE is the energy consumption
    - PP is the power consumption
    - tt is the time

Network Scaling:

- **Definition:** Ensuring the network can scale efficiently with the addition of new devices.
- **Formula:**
    - **Network Capacity:** $$ C = B \cdot \log_2 (1 + \text{SNR}) $$ Where:
    - CC is the capacity

- BB is the bandwidth
- SNR\text{SNR} is the Signal-to-Noise Ratio

Communication technology has evolved significantly over centuries, transforming how we share information and connect with each other. Here are some key historical milestones:

Ancient Times

- **100,000 BC:** Development of human speech, enabling verbal communication

Integral Derivation in Thermodynamics:

- **Gibbs Free Energy (**ΔG\Delta G**) Calculation:**
  - Formula for the Gibbs free energy change: $$ \Delta G = \Delta H - T \Delta S $$ Where:
    - ΔH\Delta H is the enthalpy change
    - TT is the temperature (in Kelvin)
    - ΔS\Delta S is the entropy change
- **Nernst Equation:**
  - Used to calculate the cell potential under non-standard conditions: $$ E = E^\circ - \frac{RT}{nF} \ln Q $$ Where:
    - EE is the cell potential
    - E∘E^\circ is the standard cell potential
    - RR is the universal gas constant
    - TT is the temperature (in Kelvin)
    - nn is the number of moles of electrons
    - FF is Faraday's constant
    - QQ is the reaction quotient

Kinetics and Electron Transfer Processes:

- **Rate of Reaction:**
    - Formula for the rate of an electrochemical reaction: $$ \text{Rate} = k[A]^{m[B]}n $$ Where:
        - kk is the rate constant
        - [A][A] and [B][B] are the concentrations of reactants
        - mm and nn are the reaction orders
- **Butler-Volmer Equation:**
    - Describes the current density as a function of overpotential: $$ j = j_0 \left(\exp \left(\frac{\alpha n F \eta}{RT} \right) - \exp \left(-\frac{(1-\alpha) n F \eta}{RT} \right) \right) $$ Where:
        - jj is the current density
        - j0j_0 is the exchange current density
        - α\alpha is the charge transfer coefficient
        - η\eta is the overpotential

System Design and Operation

- **Electrochemical Cell Design:**
    - **Anode and Cathode Selection:** Choosing appropriate materials for the anode and cathode based on their electrochemical properties.
    - **Electrolyte:** Selecting the right electrolyte to ensure efficient ion transport and minimal resistance.
    - **Configuration:** Designing the cell layout to optimize performance, durability, and safety.
- **Operational Parameters:**
    - **Temperature Control:** Ensuring the system operates within the optimal temperature range for maximum efficiency.
    - **Current Density:** Regulating the current density to balance between reaction rate and energy efficiency.

- **Maintenance:** Implementing regular maintenance protocols to ensure the longevity and reliability of the system.

Battery Technologies for Infrastructure

Lithium-ion Batteries:

- **Structure:**
  - Composed of a positive electrode (cathode), a negative electrode (anode), and an electrolyte that allows for ion transport.
- **Function:**
  - During discharge, lithium ions move from the anode to the cathode through the electrolyte, releasing energy.
- **Applications:**
  - Widely used in portable electronics, electric vehicles, and grid energy storage due to their high energy density and long cycle life.

Lead-acid Batteries:

- **Traditional Uses:**
  - Commonly used in automotive applications for starting, lighting, and ignition (SLI) due to their reliability and cost-effectiveness.
- **Modern Improvements:**
  - Enhanced designs for better performance, such as AGM (Absorbent Glass Mat) and gel batteries, which offer improved safety and efficiency.

Emerging Technologies:

- **Solid-state Batteries:**
  - Use a solid electrolyte instead of a liquid one, offering higher energy density, improved safety, and longer life cycles.
- **Other Advanced Technologies:**

- Exploring batteries like lithium-sulfur, lithium-air, and flow batteries for specific applications requiring high energy capacity and efficien

34.6 Performance Benefits of Immutable Data

Investigating the performance benefits that immutable data can bring to web applications and how these benefits can be maximized.

Performance Improvements

Understanding how immutable data can enhance performance:

1. **Reduced Unnecessary Re-renders:**
    - **Explanation:** In web applications, especially those using frameworks like React, immutable data structures can help optimize re-rendering processes. By ensuring data is unchanged, the application can more efficiently determine when to re-render components.
    - **Calculation:** Suppose O(n)O(n) is the complexity for checking if data has changed.
        - **Mutable Data:** Every change requires a deep comparison, leading to higher computational costs.
        - **Immutable Data:** Directly comparing references, leading to O(1)O(1) complexity for detecting changes, reducing overhead.
2. **Improved Debugging and Testing:**
    - **Explanation:** Immutable data structures can make debugging and testing easier because the data state is predictable and stable, leading to fewer side effects.
    - **Calculation:** Less time spent on debugging and fewer bugs introduced due to unexpected data mutations.

Optimization Techniques

Techniques for maximizing the performance benefits of immutable data:

1. **Use of Libraries:**

- **Immutable.js:** A library providing persistent immutable data structures.
    - **Example:**

      javascript

38.7 Electrochemical Sensors and Monitoring

Integral and Derivative Calculations in Electrochemical Sensors

Design and Function:

Electrochemical sensors are designed to detect and measure specific chemical compounds by generating an electrical signal that is proportional to the concentration of the compound of interest. These sensors are commonly used for monitoring environmental conditions and assessing the structural health of infrastructure.

Integral Calculations:

- **Signal Integration:**
    - To measure the total amount of analyte over time, integration of the sensor signal I(t)I(t) is performed: $$ Q = \int_0^T I(t) \, dt $$
    - Where QQ is the total charge, I(t)I(t) is the current as a function of time, and TT is the total time period.

Derivative Calculations:

- **Rate of Change:**
    - To assess the rate of change of the analyte concentration, the derivative of the sensor signal can be calculated: $$ \frac{dC}{dt} = k \frac{dI}{dt} $$
    - Where CC is the concentration, II is the current, and kk is a constant.

38.8 Electrolysis and Industrial Processes

Integral and Derivative Calculations in Electrolysis

Water Splitting for Hydrogen Production:

- **Integral Calculations:**
    - **Total Hydrogen Production:** $$ H_2 (g) = \int_0^T \left(\frac{I(t)}{2F} \right) dt $$
        - Where H2H_2 is the amount of hydrogen gas produced, I(t)I(t) is the current as a function of time, FF is Faraday's constant, and TT is the total time.
- **Derivative Calculations:**
    - **Current Density:** $$ J = \frac{dI}{dA} $$
        - Where JJ is the current density, II is the current, and AA is the electrode area.

Metal Plating:

- **Integral Calculations:**
    - **Total Metal Deposited:** $$ M = \int_0^T \left(\frac{I(t) \cdot M}{nF} \right) dt $$
        - Where MM is the mass of the metal deposited, I(t)I(t) is the current as a function of time, nn is the number of electrons involved in the reaction, FF is Faraday's constant, and TT is the total time.
- **Derivative Calculations:**
    - **Rate of Deposition:** $$ \frac{dM}{dt} = \frac{I(t) \cdot M}{nF} $$
        - Where dM/dtdM/dt is the rate of metal deposition.

38.9 Sustainability and Electrochemical Engineering

Impact on Sustainable Infrastructure Development

Energy Efficiency:

- **Integral Calculations:**
    - **Energy Consumption:** $$ E = \int_0^T P(t) \, dt $$
        - Where EE is the total energy consumption, P(t)P(t) is the power consumption as a function of time, and TT is the total time period.

Resource Recovery:

- **Integral Calculations:**
    - **Recovered Resources:** $$ R = \int_0^T r(t) \, dt $$
        - Where RR is the total amount of resources recovered, r(t)r(t) is the recovery rate as a function of time, and TT is the total time period.

Environmental Impact:

- **Derivative Calculations:**
    - **Rate of Emission Reduction:** $$ \frac{dE_r}{dt} = f(t) $$
        - Where ErE_r is the emission reduction, and f(t)f(t) is a function representing the rate of emission reduction over tim

5. Automating Electrical Design Processes

Key Topics:

- **Repetitive Task Automation:** Identifying and automating repetitive tasks in electrical design.
- **Efficiency Improvement:** Enhancing efficiency and productivity through automation.
- **Error Reduction:** Minimizing human errors.

Integral and Derivative Calculations in Automating Electrical Design Processes

Repetitive Task Automation

Identifying and Automating Repetitive Tasks:

- **Integral Calculations:**
    - **Total Time Spent on Repetitive Tasks:** $$ T = \int_0^N t_i \, di $$
        - Where TT is the total time, tit_i is the time spent on each task, and NN is the total number of tasks.
- **Derivative Calculations:**
    - **Rate of Task Completion:** $$ \frac{dT}{dt} = \text{Rate of Task Completion} $$
        - Where TT is the number of tasks and tt is the time.

Example:

- Identifying tasks such as circuit simulations, schematic updates, and documentation that can be automated using Robotic Process Automation (RPA) tools like UiPath or Automation Anywhere.

Efficiency Improvement

Enhancing Efficiency and Productivity through Automation:

- **Integral Calculations:**
    - **Total Efficiency Gain:** $$ E = \int_0^T \frac{P_a - P_m}{P_m} \, dt $$
        - Where EE is the efficiency gain, PaP_a is the productivity with automation, PmP_m is the productivity without automation, and TT is the total time.
- **Derivative Calculations:**
    - **Rate of Efficiency Improvement:** $$ \frac{dE}{dt} = \text{Rate of Efficiency Improvement} $$

        - Where EE is the efficiency and tt is the time.

Example:

- Automating tasks such as generating Bill of Materials (BOM), performing simulations, and generating design reports to save time and reduce manual effort.

Error Reduction

Minimizing Human Errors:

- **Integral Calculations:**
    - **Total Errors Before and After Automation:** $$ E_{\text{total}} = \int_0^N e_{\text{manual}} \, di - \int_0^N e_{\text{automated}} \, di $$
        - Where EtotalE_{\text{total}} is the total error reduction, emanuale_{\text{manual}} is the error rate with manual processes, eautomatede_{\text{automated}} is the error rate with automated processes, and NN is the total number of tasks.
- **Derivative Calculations:**
    - **Rate of Error Reduction:** $$ \frac{dE_r}{dt} = \text{Rate of Error Reduction} $$
        - Where ErE_r is the error reduction and tt is the time.

Project Management in Electrical Engineering

Principles and practices of effective project management tailored to electrical engineering projects and infrastructure.

Key Topics:

- **Project Planning:**
    - Techniques for planning electrical engineering projects.
- **Resource Management:**

    - Managing resources effectively in electrical projects.

- **Risk Management:**
    - Identifying and mitigating risks.

Integral and Derivative Calculations in Project Management

Project Planning

Techniques for planning electrical engineering projects:

- **Integral Calculations:**
    - **Total Project Time:** $$ T = \int_0^N t_i \, di $$
        - Where TT is the total project time, tit_i is the time for each task, and NN is the total number of tasks.
    - **Cumulative Budget:** $$ B = \int_0^T b(t) \, dt $$
        - Where BB is the total budget, and b(t)b(t) is the budget allocation over time TT.
- **Derivative Calculations:**
    - **Rate of Task Completion:** $$ \frac{dN}{dt} = \text{Rate of Task Completion} $$
        - Where NN is the number of completed tasks, and tt is the time.

Example:

- Creating Gantt charts and project timelines by integrating task durations to visualize the overall project schedule.

Resource Management

Managing resources effectively in electrical projects:

- **Integral Calculations:**
    - **Total Resource Allocation:** $$ R = \int_0^T r(t) \, dt $$

        - Where RR is the total resource allocation, and r(t)r(t) is the resource allocation rate over time TT.

- **Derivative Calculations:**

    - **Rate of Resource Utilization:** $$ \frac{dR}{dt} = \text{Rate of Resource Utilization} $$

        - Where RR is the resource utilization, and tt is the time.

Example:

- Estimating the total amount of resources (e.g., labor, equipment) needed for the project by integrating resource usage over time.

Risk Management

Identifying and mitigating risks:

- **Integral Calculations:**

    - **Cumulative Risk Impact:** $$ I = \int_0^T i(t) \, dt $$

        - Where II is the total risk impact, and i(t)i(t) is the impact of risks over time TT.

- **Derivative Calculations:**

    - **Rate of Risk Occurrence:** $$ \frac{dR}{dt} = \text{Rate of Risk Occurrence} $$

        - Where RR is the risk occurrence, and tt is the time

Wind Energy, Solar Energy, and Hydroelectric Power

Wind Energy: Understanding the Technology and Integration

- **Integral Calculations:**

    - **Total Power Output:** $$ P_{\text{total}} = \int_0^T P(t) \, dt $$

        - Where PtotalP_{\text{total}} is the total power output over time TT, and P(t)P(t) is the power at time tt.

    - **Energy Harvested:** $$ E = \int_0^T \frac{1}{2} \rho A v^3 \eta \, dt $$
        - Where EE is the energy harvested, ρ\rho is the air density, AA is the swept area of the turbine blades, vv is the wind speed, and η\eta is the efficiency.

- **Derivative Calculations:**
    - **Rate of Change of Power Output:** $$ \frac{dP}{dt} $$
        - Where PP is the power output and tt is the time.

Solar Energy: Exploring Photovoltaic Systems

- **Integral Calculations:**
    - **Total Energy Generated:** $$ E_{\text{total}} = \int_0^T P(t) \, dt $$
        - Where EtotalE_{\text{total}} is the total energy generated, and P(t)P(t) is the power output at time tt.
    - **Energy Efficiency:** $$ \eta = \frac{E_{\text{generated}}}{E_{\text{incident}}} $$
        - Where η\eta is the efficiency, EgeneratedE_{\text{generated}} is the energy generated by the solar panel, and EincidentE_{\text{incident}} is the incident solar energy.

- **Derivative Calculations:**
    - **Rate of Energy Generation:** $$ \frac{dE}{dt} = P(t) $$
        - Where EE is the energy and tt is the time.

Hydroelectric Power: Implementing Hydroelectric Systems

- **Integral Calculations:**
    - **Total Energy Production:** $$ E = \int_0^T P(t) \, dt $$
        - Where EE is the total energy production, and P(t)P(t) is the power output at time tt.

    - **Hydraulic Head Calculation:** $$ H = \int_{z_1}^{z_2} dz $$
        - Where HH is the hydraulic head, and z1z_1 and z2z_2 are the initial and final elevation levels.

- **Derivative Calculations:**
    - **Rate of Flow:** $$ \frac{dQ}{dt} $$
        - Where QQ is the flow rate and tt is the time.

Electrical Infrastructure Design and Management

Infrastructure Planning

- **Integral Calculations:**
    - **Total Project Time:** $$ T_{\text{total}} = \int_0^N t_i \, di $$
        - Where TtotalT_{\text{total}} is the total project time, tit_i is the time for each task, and NN is the total number of tasks.

- **Derivative Calculations:**
    - **Rate of Task Completion:** $$ \frac{dT}{dt} $$
        - Where TT is the number of completed tasks, and tt is the time.

Design Methodologies

- **Integral Calculations:**
    - **Total Resource Allocation:** $$ R = \int_0^T r(t) \, dt $$
        - Where RR is the total resource allocation, and r(t)r(t) is the resource allocation rate over time TT.

- **Derivative Calculations:**
    - **Rate of Design Completion:** $$ \frac{dD}{dt} $$
        - Where DD is the design progress, and tt is the time.

Management Practices

- **Integral Calculations:**
    - **Total Cost:** $$ C_{\text{total}} = \int_0^T c(t) \, dt $$
        - Where CtotalC_{\text{total}} is the total cost, and c(t)c(t) is the cost over time TT.
- **Derivative Calculations:**
    - **Rate of Cost Increase:** $$ \frac{dC}{dt} $$
        - Where CC is the cost, and tt is the time.

Smart Grids and IoT Applications

Smart Grid Technology

- **Integral Calculations:**
    - **Total Energy Savings:** $$ E_{\text{total}} = \int_0^T \left(E_{\text{conventional}} - E_{\text{smart}} \right) \, dt $$
        - Where EtotalE_{\text{total}} is the total energy savings, EconventionalE_{\text{conventional}} is the energy consumption of conventional grids, and EsmartE_{\text{smart}} is the energy consumption of smart grids.
- **Derivative Calculations:**
    - **Rate of Energy Consumption:** $$ \frac{dE}{dt} $$
        - Where EE is the energy consumption, and tt is the time.

IoT in Electrical Systems

- **Integral Calculations:**
    - **Total Data Collected:** $$ D_{\text{total}} = \int_0^T d(t) \, dt $$
        - Where DtotalD_{\text{total}} is the total data collected, and d(t)d(t) is the data collection rate over time TT.
- **Derivative Calculations:**
    - **Rate of Data Transmission:** $$ \frac{dD}{dt} $$

        - Where DD is the data collected, and tt is the time.

Overview of wireless communication systems, historical developments, and contemporary applications:

- **Historical Developments:**
    - From Marconi's first transatlantic radio transmission to modern cellular networks.
- **Contemporary Applications:**
    - Smartphones, IoT devices, satellite communications, and Wi-Fi networks.

29.3 Radio Frequency Fundamentals

Exploration of radio frequency (RF) spectrum, key RF principles, and their application in wireless communication:

- **RF Spectrum:**
    - Allocation of frequencies for different communication services.
- **Key RF Principles:**
    - Frequency, wavelength, and their relation: $$ \lambda = \ frac{c}{f} $$ Where λ\lambda is the wavelength, cc is the speed of light, and ff is the frequency.

29.4 Wireless Signal Propagation

Understanding the behavior of wireless signals over various media and environments, including path loss, fading, and interference:

- **Path Loss:**
    - Free-space path loss calculation: $$ PL = 20 \log_{10}\left(\ frac{4\pi d f}{c}\right) $$ Where PLPL is the path loss, dd is the distance, ff is the frequency, and cc is the speed of light.
- **Fading:**

- Types of fading: multipath, shadowing, and Doppler effect.

- **Interference:**
  - Sources and mitigation techniques.

29.5 Multiple Access Techniques

Survey of multiple access schemes including FDMA, TDMA, CDMA, and OFDMA, which enable multiple users to share the same frequency band:

- **FDMA (Frequency Division Multiple Access):**
  - Dividing the frequency band into distinct channels.
- **TDMA (Time Division Multiple Access):**
  - Dividing the time into slots for different users.
- **CDMA (Code Division Multiple Access):**
  - Using unique codes for each user to share the same frequency band.
- **OFDMA (Orthogonal Frequency Division Multiple Access):**
  - Subdividing the frequency band into orthogonal sub-carriers.

29.6 Wireless Networking and Protocols

Introduction to wireless network design, including protocol layers, network architectures, and routing protocols:

- **Protocol Layers:**
  - Understanding the OSI model and TCP/IP stack.
- **Network Architectures:**
  - Cellular, ad hoc, mesh, and hybrid networks.
- **Routing Protocols:**
  - AODV, DSR, and OLSR.

29.7 Cellular Systems and 5G

In-depth analysis of cellular network architecture, with a focus on the evolution from 1G to 5G, and future trends:

- **1G to 4G Evolution:**
    - Analog to digital, increased data rates, and enhanced services.
- **5G Technology:**
    - Enhanced mobile broadband (eMBB), massive machine-type communications (mMTC), and ultra-reliable low-latency communications (URLLC).
- **Future Trends:**
    - 6G, AI in telecommunications, and beyond.

29.8 Antenna Theory and Design

Integral and Derivative Calculations in Antenna Theory:

- **Integral Calculations:**
    - **Radiation Pattern Integration:** $$ P_{\text{rad}} = \int_0^{2\pi} \int_0^\pi U(\theta, \phi) \sin \theta \, d\theta \, d\phi $$ Where PradP_{\text{rad}} is the total radiated power, U(θ,ϕ)U(\theta, \phi) is the radiation intensity, and θ\theta and ϕ\phi are the spherical coordinates.
- **Derivative Calculations:**
    - **Antenna Gain:** $$ G(\theta, \phi) = \frac{dU(\theta, \phi)}{dP_{\text{in}}} $$ Where G(θ,ϕ)G(\theta, \phi) is the antenna gain, U(θ,ϕ)U(\theta, \phi) is the radiation intensity, and PinP_{\text{in}} is the input power.

Understanding the Basic Concepts of Social Media Marketing

Social media marketing involves using platforms like Facebook, Instagram, Twitter, LinkedIn, and TikTok to promote products, services, or brands. The goal is to engage with potential customers, build relationships, and drive traffic to websites or online stores.

Here's a breakdown of some key concepts:

1. Audience Engagement:

- **Integral Calculations:**
    - **Total Engagement:** $$ E_{\text{total}} = \int_0^T E(t) \, dt $$
        - Where EtotalE_{\text{total}} is the total engagement over time TT, and E(t)E(t) is the engagement rate at time tt.

2. Content Reach:

- **Derivative Calculations:**
    - **Rate of Reach:** $$ \frac{dR}{dt} $$
        - Where RR is the reach, and tt is the time.

3. Conversion Rates:

- **Integral Calculations:**
    - **Total Conversions:** $$ C_{\text{total}} = \int_0^T C(t) \, dt $$
        - Where CtotalC_{\text{total}} is the total conversions over time TT, and C(t)C(t) is the conversion rate at time tt.

Television and Radio Production Essentials

An introduction to the fundamentals of television and radio production, focusing on skills necessary for creating high-quality media content.

Key Topics:

Television Production Basics

Camera Operation and Techniques:

- **Integral Calculations:**
    - **Total Recording Time:** $$ T_{\text{recording}} = \int_0^N t_i \, di $$

        - Where TrecordingT_{\text{recording}} is the total recording time, tit_i is the time for each segment, and NN is the number of segments.

Lighting and Sound Design:

- **Integral Calculations:**
    - **Total Light Exposure:** $$ E_{\text{light}} = \int_0^T L(t) \, dt $$
        - Where ElightE_{\text{light}} is the total light exposure, L(t)L(t) is the light intensity over time TT.

Directing and Producing TV Segments:

- **Derivative Calculations:**
    - **Rate of Scene Transition:** $$ \frac{dS}{dt} $$
        - Where SS is the number of scene transitions, and tt is the time.

Radio Production Basics

Audio Recording and Editing:

- **Integral Calculations:**
    - **Total Audio Duration:** $$ T_{\text{audio}} = \int_0^N t_i \, di $$
        - Where TaudioT_{\text{audio}} is the total audio duration, tit_i is the time for each audio clip, and NN is the number of clips.

Scriptwriting for Radio Broadcasts:

- **Derivative Calculations:**
    - **Rate of Script Progress:** $$ \frac{dW}{dt} $$
        - Where WW is the number of words written, and tt is the time.

Hosting and Interviewing Techniques:

- **Integral Calculations:**
    - **Total Interview Duration:** $$ T_{\text{interview}} = \int_0^N t_i \, di $$
        - Where TinterviewT_{\text{interview}} is the total interview duration, tit_i is the time for each interview, and NN is the number of interviews.

Advanced Production Skills

Multi-Camera Setups and Live Broadcasting:

- **Integral Calculations:**
    - **Total Camera Coverage:** $$ C_{\text{total}} = \int_0^T C(t) \, dt $$
        - Where CtotalC_{\text{total}} is the total camera coverage, and C(t)C(t) is the camera coverage at time TT.

Post-Production Editing and Special Effects:

- **Derivative Calculations:**
    - **Rate of Editing Progress:** $$ \frac{dE}{dt} $$
        - Where EE is the amount of editing completed, and tt is the time.

Integrating Graphics and Animations:

- **Integral Calculations:**
    - **Total Animation Duration:** $$ T_{\text{animation}} = \int_0^N t_i \, di $$
        - Where TanimationT_{\text{animation}} is the total animation duration, tit_i is the time for each animation, and NN is the number of animations.

Production Software

Inbox

R

Roberto Aldrett - AIU 6:31 AM (10 hours ago)

to me

Atlantic International University

A New Age for Distance Learning

Admissions Department - Atlantic International University

From: **Roberto Aldrett**, Communications Coordinator

1/28/2025

tshingombe tshitadi

Applying for: Masters of

Johannesburg South Africa

Dear tshingombe

I am writing to let you know that your acceptance and placement offer to you is set, your Virtual Campuses (Academic and MYAUI) have been created. I want to express to you how delighted the AIU community is that you will be joining a very selected number of students from more than 160 countries of the world. Your placement for the Masters of will be secured after we received your registration fee that is due on **31st of January, 2025.**. Remember at AIU, registration / application fee and first tuition is all the same (One small single payment).

To understand the real meaning of AIU
Degrees: https://vimeo.com/549087436/34bc313fc5

To complete your application:

- Make sure you have read your Admission letter and payment plan.

- Send us your CV and all academic documents. It is very important!

- Do your application payment. In case of admission, it will be applied as your registration fee.

Application Fee: 150 USD

You can do a direct payment with your **Visa, Master Card, or American Express Credit or Debit Card** here:

Click to pay: https://securepayments.aiu.edu

Or you can use the following methods of Payment:

2. **WIRE TRANSFER**

   Citi Bank

   Name of the Account: Atlantic International University Account Number: 9137954440 ABA/Routing Number: 021000089 (International)

   ABA/Routing Number: 266086554 (US /Domestic) SWIFT Code: CITIUS33 Address of the Bank: 399 Park Avenue, New York, NY 10043

   PLEASE IF YOU DO AN ONLINE TRANSFFER FROM ACCOUNT TO ACCOUNT PLEASE SEND THE RECEIPT AND YOUR COMPLETE INFORMATION IN ORDER FOR US TO POST YOUR PAYMENT CORRECTLY OR SEND YOUR RECEIPT BY EMAIL TO roberto @aiu.edu or FINANCE@AIU.EDU

6. **PayPal:** If you have a PayPal account use the following

information:

Name: Atlantic International University

E-mail: admissions@aiu.edu

Please make sure you add the 4% PayPal charges when sending a payment. Please upload your receipt through your student section.

https://www.aiu.edu/tuition/

7. **Zelle Payments**

E-mail: finance@aiu.edu

Please upload or email your confirmation receipt for us to verify your payment.

8. **Klasha (Africa including South Africa, Nigeria, Kenya, Ghana, Zambia, and Tanzania)**

From the convenience of your mobile device, KLASHA will allow you to send payments using a local credit card or local transfer to AIU. This method will help you reduce fees and save time when paying your fees.

If you would like to pay via Klasha download our mobile app on **Google play store** **or** **IOS**

and set up the account. After which you can fund the account and use the money in the wallet to make transactions.

If you already to pay, please click on the link below:

Click to Pay Now: https://aiusecurepayments.org/klasha/

9. **Cryptocurrency** (Bitcoin, Ethereum, DAI, US coin, etc.)

To learn more about this payment method, we encourage you to watch the video : https://vimeo.com/657490143/09955932e8

If you would like to use this payment method, please click on the link below, scroll to the bottom of the tuition page and select your payment method.

https://www.aiu.edu/tuition/

10. **Western Union: Quick Collect**

Name: Atlantic International University

Company Code: ATLANTICUNIVERSITYHI

Account Number: Provisional Student ID

The transaction fee will vary from country to country.

IMPORTANT: Take in consideration that we are not a person, but an institution. So, you can't do a person to person transaction but a Quickpay or Quick Collect. WESTERN UNION QUICKPAY or QUICK COLLECT is the option to pay for your tuition. Sometimes you have to insist the Western Union representative that you need to do a Quickpay or a Quick Collect.

We look forward to helping you with your studies. I appreciate your confidence in me and am very happy that you are joining AIU.

Sincerely,

Roberto Aldrett - roberto@aiu.edu
- Communications Coordinator -
Atlantic International University - http://www.aiu.edu
900 Fort Street - 905, Honolulu Hawaii 96813. USA

100% Distance Learning Online University

¡Save Time and Enroll Today!

Would you like to see the tuition fees of your program and areas of study available? Complete the Online Application below and accelerate your qualification process:

CLICK HERE to Complete Your Online Application

Benefits of the Online Application

1. Do you need to apply for Financial Assistance?

Complete the application and select the monthly payments plan in order to apply for Financial Assistance. You will be able to create a custom payment plan with a partial scholarship.

2. How can you complete your enrollment?

After completing your online application, you will be able to pay your enrollment fee online by card or PayPal, or receive payment instructions for Wire Transfers and Western Union

3. Would you like to learn more about your program?

Complete the application to receive a complete list of the most common questions and answers regarding your studies at AIU, such as program length, courses, mode of study and more.

Advantages of studying online with AIU

√ **100% Online Studies through AIU's Virtual Campus** (student section open 24/7). Select a flexible class schedule and study from your location through your computer or smartphone.

√ **Online Library** with more than 130 thousand books at no additional cost!

√ **Andragogic Studies and Open Academic Curriculum**

Select courses of your interest by building your course outline

√ **Human Development Center:** Access the My AIU Platform

Admissions Steps to Enroll at AIU

1. Complete Your Online Application - Pending

You will receive your Admissions Letter after your application has been

reviewed.

2. Complete Your Enrollment Fee Payment - Pending

This step must be completed in order to continue to Step 3. You will receive instructions according to your selected payment method after receiving your Admissions Letter.

3. Upload Your Previous Academic Diploma - Pending

After completing Steps 1 & 2, you will receive the Orientation Package with guidelines on how to submit your previous academic diplomas and transcripts on your student section.

4. Begin Your Studies - Pending

This is the final step where you will be able to select your courses and begin your studies at Atlantic International University.

If you have any questions, feel free to contact us or visit our website for more information.

Apply Now

ar Future AIU Student tshingombe

25 Year Anniversary | AIU
Atlantic International University

Unique & Unrepeatable!

Complete Your Enrollment Fee Payment of US $150 today

You told me your goals, about how you want to increase your income and just have an opportunity for growth, do not put this dream on hold.

Therefore I have extended your enrollment deadline until January 24, 2025 with the scholarship you were awarded.

Access your online Student Section and start studying your Masters Degree in electrical engineering by completing your AIU enrollment and gaining immediate access to your online student section today!

Payment Plan Summary:

Degree: Masters in electrical engineering

Enrollment Fee: $150 US

If you submit a successful payment with a credit card, you will receive a payment confirmation email and enrollment fee will be processed much faster and receive immediate access to your Online Student Section!

Dear tshingombe tshitadi,

We received your request to apply for a Masters partial scholarship at Atlantic International University on 12/17/2024 10:49:16 PM

Please update your application below including the financial part to see what max scholarship you qualify for in the next 48 hours.

Discover some of the UNIQUE benefits of studying at AIU:

- Reach your maximum POTENTIAL
- Choose YOUR courses and design your perfect **100% customized**

program outline

- Study anywhere from your mobile or computer through our **online student section open 24/7**
- Generate solutions to any challenge you face.

Complete Your Enrollment Fee Payment of US $150 today

You told me your goals, about how you want to increase your income and just have an opportunity for growth, do not put this dream on hold.

Therefore I have extended your enrollment deadline until January 24, 2025 with the scholarship you were awarded.

Access your online Student Section and start studying your Masters Degree in electrical engineering by completing your AIU enrollment and gaining immediate access to your online student section today!

-

Awarded

We're excited to grant you exclusive live class access this week!.

This special opportunity allows you to log in to any class you choose, all week long, and experience firsthand the valuable knowledge and skills you'll gain when you enroll in your Masters program.

Ready to take the next step? **Update your application today and secure the scholarship you deserve.** Don't miss this chance to start building your future!:

Career Coach

Looking for an opportunity at AIU? Complete the following application form in order to apply for current or future positions at AIU, if you want to search for current positions in other companies, you can use our search engine by clicking here, please be advised that you will be redirected to outside websites.

Complete the following application form in order to apply for current or future positions at AIU, if you want to search for current positions in other companies, you can use our search engine by clicking here, please be advised that you will be redirected to outside websites.

Job Search Outside AIU

Position of your interest

Academic/Faculty Administrative/Student Services Finance/Accounting Researcher/Co-Author Admissions

Upload your Resume/CV

List the Institutions and Degrees you have completed

List the Companies/positions you have worked in

What languages do you speak (%Proficiency)?

What languages do you write (%Proficiency)?

Other Languages:

List Research Projects you have participated in:

Are you looking for a Full time or Part time position?

What is the $/Hr minimum you would like to receive from AIU

Can you travel outside of the US to present conferences on behalf of AIU?

Yes No

What do you think about Distance Learning?

What do you think about Accreditation in the US?

Do you consider yourself Competent at using computers, Internet and Basic Programs?

Yes No

Which Programs:

List Publications you have published or co-authored:

Your submission was successful.

Life-Coach Consulting

Life-coach consulting is a concept that involves a professional relationship between a trained and certified life coach and an individual seeking guidance and support in various areas of their life. The aim of life-coach consulting is to empower individuals to make positive changes, set and achieve goals, overcome obstacles, and ultimately live a more fulfilling and balanced life.

Are you ready to live this experience?

Location: Redlands CA

Specialty: People in career or life transition. Mentoring other coaches. Small business owners and entrepreneurs. Busy professionals who want a life! Scientifically validated DISC and Values assessments. LifeTrek, Inc.

Location: Bexley, OH

Subject:

- **ctuarial Science**
- **Animal Science**
- **Biomass and Biofuels**
- **Crops and Soils**
- **Developing Mobile Applications**
- **Ecotechnology**

- **Solar Energy**
- **Graphic Design**
- **Health Informatics**
- **Mathematics Didactics**
- **Multimedia Design and Digital Art**
- **Science in Geophysics**
- **Science in Sport**
- **Science in Sustainable Materials**
- **Science in the Atmosphere**
- **Wind Energy**
- **Agronomic Engineering**
- **Degree Robotics**
- **Engineering in Oil, Gas, and Energy**

- **Genetics**
- **Cybersecurity and Hacking**
- **Exercise Science**
- **Biosystems Engineering**
- **Technology in Network Interconnection**
- **Technology inCognitive Science**
- **Bioengineering**
- **Environmental Toxicology**
- **Forensic Consulting**
- **Engineering in Metallurgy**
- **Farming Science**
- **Synthetic Biology**
- **Systems and Databases**
- **Media Education**
- **(Biology Teaching)**
- **Sustainable Design and**
- **Construction**
- **Environmental Sciences**

The Future Of Science and Engineering

The future of science and engineering careers is bright. With the advent of new technologies, there are now many new opportunities.

By following these tips, you can ensure that your career path is a long one:

- Keep up with all of the newest developments in your field. If you aren't aware of changes in your area, you'll be left behind by those who are. For example, if you're a software developer, make sure you're familiar with the latest programming languages and frameworks trends.
- Don't be afraid to try something new. It's not always easy to learn a new skill or take on a new role. But by doing so, you'll be able to expand your horizons and gain an edge over your competition.
- Stay current with the latest tools and techniques. In today's world, it's more important than ever to stay ahead of the curve. If you don't know what's happening in your industry, you'll be at a competitive disadvantage.

The Constantly Changing Education Landscape

As people start to emerge from the devastation of COVID-19, everyone is asking the same question: What should education look like in a post-pandemic world?

The truth is that many aspects of the education system — from where and how we learn to what we study — need to be transformed if we want an education system that is relevant to our current world.

Here are four significant areas in which our education system needs to change:

Students expect to have the ability to learn from anywhere. This is probably one of the most obvious changes brought about by recent events: students now expect to be able to pursue their studies from any location. This versatility is vital for those students who cannot physically attend classes due to health and safety concerns or because they live in remote locations.

Student mobility is also an essential factor here. Students want the opportunity to study abroad, but they don't necessarily want or need to move overseas permanently. Remote learning options make it easier for students to move around while studying without disrupting their academic progress.

Students expect active learning rather than lectures. Students are looking for different learning experiences, such as more active, hands-on learning rather than traditional lectures.

Our world is constantly changing, and the taught skills must change with it. To create a more equitable, just, and sustainable world, we need to

get better at teaching science and engineering. Science education has the power to transform lives, improve health and livelihoods, increase wealth and drive economic growth. It can also help close the gender gap in STEM fields (science, technology, engineering, math).

If we want to change the world of science and engineering for the better, we need to find ways of supporting people who have been excluded from these fields in the past. We must do this by providing equal opportunities for everyone regardless of their race or gender identity. This change means creating spaces where people can engage with science without feeling like outsiders or imposters. We also need more women leaders who will serve as role models for young girls interested in pursuing careers related to STEM subjects.

Academic Freedom to Discover Your Purpose
Open Curriculum Design at Atlantic International University

The Master of Engineering Systems program is offered online via distance learning. After evaluating both academic record and life experience, AIU staff working in conjunction with Faculty and Academic Advisors will assist students in setting up a custom-made program, designed on an individual basis. This flexibility to meet student needs is seldom found in other distance learning programs. Our online program does not require all students to take the same subjects/courses, use the same books, or learning materials. Instead, the online Master of Engineering Systems curriculum is designed individually by the student and academic advisor.

It specifically addresses strengths and weaknesses with respect to market opportunities in the student's major and intended field of work. Understanding that industry and geographic factors should influence the content of the curriculum instead of a standardized one-fits-all design is the hallmark of AIU's unique approach to adult education. This philosophy addresses the dynamic and constantly changing environment of working professionals by helping adult students in reaching their professional and personal goals within the scope of the degree program.

Important: Below is an example of the topics or areas you may develop and work on during your studies. By no means is it a complete or required list as AIU programs do not follow a standardized curriculum. It is meant solely as a reference point and example. Want to learn more about the curriculum design at AIU? (Course and Curriculum)

Core Courses and Topics in Engineering Systems:

Applied Physics
Supply Chain Management

Global Competitive Environment
Legal Environment of Business
Total Quality Management and Improvement
Management of Systems Projects
Engineering Analysis for Decision Making

Engineering Management Control Systems
Engineering Economy
Systems Optimization and Analysis
Systems Testing and Reliability
Systems Engineering Management
Systems Engineering Design

Orientation Courses:

Communication & Investigation (Comprehensive Resume)
Organization Theory (Portfolio)
Experiential Learning (Autobiography)
Academic Evaluation (Questionnaire)
Fundament of Knowledge (Integration Chart)
Fundamental Principles I (Philosophy of Education)
Professional Evaluation (Self Evaluation Matrix)
Development of Graduate Study (Guarantee of an Academic Degree)

Research Project in Engineering Systems:

Masters Thesis Project
MBM300 Thesis Proposal
MBM302 Master Thesis (7,500 words)
Publication: Each Master of Engineering Systems graduate is encouraged to publish their research papers either online in the public domain or through professional journals and per

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Core Courses and Topics in Engineering Systems:

Applied Physics
Supply Chain Management
Global Competitive Environment
Legal Environment of Business
Total Quality Management and Improvement
Management of Systems Projects
Engineering Analysis for Decision Making

Engineering Management Control Systems
Engineering Economy
Systems Optimization and Analysis
Systems Testing and Reliability
Systems Engineering Management
Systems Engineering Design

Orientation Courses:

Communication & Investigation (Comprehensive Resume)
Organization Theory (Portfolio)
Experiential Learning (Autobiography)
Academic Evaluation (Questionnaire)
Fundament of Knowledge (Integration Chart)
Fundamental Principles I (Philosophy of Education)
Professional Evaluation (Self Evaluation Matrix)
Development of Graduate Study (Guarantee of an Academic Degree)

Research Project in Engineering Systems:

Masters Thesis Project
MBM300 Thesis Proposal
MBM302 Master Thesis (7,500 words)
Publication: Each Master of Engineering Systems graduate is encouraged to publish their research papers either online in the public domain or through professional journals and per

Academic Freedom to Discover Your Purpose
Open Curriculum Design at Atlantic International University

The Master of Engineering Systems program is offered online via distance learning. After evaluating both academic record and life experience, AIU staff working in conjunction with Faculty and Academic Advisors will assist students in setting up a custom-made program, designed on an individual basis. This flexibility to meet student needs is seldom found in other distance learning programs. Our online program does not require all students to take the same subjects/courses, use the same books, or learning materials. Instead, the online Master of Engineering Systems curriculum is designed individually by the student and academic advisor.

It specifically addresses strengths and weaknesses with respect to market opportunities in the student's major and intended field of work. Understanding that industry and geographic factors should influence the content of the curriculum instead of a standardized one-fits-all design is the hallmark of AIU's unique approach to adult education. This philosophy addresses the dynamic and constantly changing environment of working professionals by helping adult students in reaching their professional and personal goals within the scope of the degree program.

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Student_name : _tshingombe_tshitadi

1 topics :

1 AGI in Human-Machine Collaboration

Exploring how AGI can augment human capabilities and lead to new forms of collaboration.

Future Scenarios of AGI Development

Examining possible future scenarios regarding the development and integration of AGI into everyday life.

1.10nline Retail and E-commerce in the Renewable Energy Sector

This course explores the intersection of online retail and e-commerce with renewable energy. Students will gain expertise in leveraging digital platforms to promote and sell renewable energy solutions, products, and services. The course covers market trends, customer behavior, e-commerce strategies, and sustainability practices.

1.2 Introduction to E-commerce in the Renewable Energy Sector

An overview of the e-commerce landscape specifically tailored for renewable energy products, services, and solutions.

In 2025, the commerce landscape will be more interwoven with sustainability than ever before. Based on the content extracted from the provided article, here is a Key Takeaways section: any firms are innovating in the ways in which they sell products online. Firms can make use of a range of digital technologies, including artificial intelligence, blockchain, the Internet of Things and autonomous delivery devices like drones or robots to facilitate e-commerce, while new payment services like mobile money and digital wallets widen the scope of e-commerce.

Online platforms match buyers and sellers, including across borders, to facilitate online transactions. Online platforms enable more and different products to be sold, but often require mechanisms that match buyers and sellers, boost trust among unknown e-commerce participants, and encourage more firms to enter the marketplace. Also growing are subscription service business models (e.g. music streaming). Such models enable the continuous provision of products in exchange for recurring payments. Consumers may find such models convenient, particularly for goods that require replenishment, while firms may benefit from lower marginal costs, reduced frictions and longer-term revenue streams. A third business model includes those that use offline or physical features to sell online (e.g. omni-channel models). From automated supermarkets to skip-the-queue mobile application ordering, more firms are experimenting with mechanisms that enable e-commerce while removing the frictions associated with offline ordering.

1.3 Understanding the Renewable Energy Market

Insights into the renewable energy market, including key players, trends, and consumer

Targeted, flexible and co-ordinated policies can unlock the potential of e-commerce

The rise of the Internet in the 1990s fuelled the growth of e-commerce and put it on the agenda of policy makers worldwide. But the rapid pace at which digital transformation has progressed and the dynamism of e-commerce markets requires a fresh look at policy frameworks to ensure that they support further e-commerce innovations. In particular, three policy considerations should be taken into account.

1.4. E-commerce Strategies for Renewable Energy Products

Effective e-commerce strategies tailored for marketing and selling renewable energy products online.

E-commerce must be better measured and e-commerce policy more co-ordinated to unlock the potential of e-commerce for all

Technological change is altering the e-commerce landscape, and these new developments affect policy frameworks along several dimensions. Some of the challenges identified in the early days of e-commerce remain relevant (e.g. related to data protection), but new challenges have also emerged (e.g. the rise of tradeable services and their implications for trade policy). These developments require a holistic approach to e-commerce policy making, including co-operation and collaboration across policy areas. In particular, consumer protection, taxation, competition, trade and environmental policies should be co-ordinated, including at the highest levels of government and at the global level, to ensure that trade-offs are carefully considered and to guard against unintended consequences of misaligned policy action. Many such rules are local, which further underscores the need for a consistent and co-ordinated whole-of-government approach to e-commerce policy making at all levels of government.

At the same time, a lack of e-commerce data limits the ability of policy makers to determine the need for policy action and calls for more focus on the e-commerce measurement agenda. On the one hand, the harmonisation of available data on e-commerce across countries (e.g. ICT usage surveys) should continue and adjust in response to an evolving technological environment. Changing technologies and business models might eventually also warrant a reconsideration of the current OECD e-commerce definition. At the same time, the limitations of ICT usage surveys requires governments to foster the inclusion of e-commerce related questions in other official data sources, such as structural business or household expenditure surveys, as well as the use of non-standard data sources.

Targeted policies can address e-commerce divides

Those who do not or cannot engage in e-commerce may find themselves on the wrong side of a potentially persistent and harmful digital divide as digital transformation progresses. SMEs lag behind larger firms in terms of e-commerce participation, but policy can help by addressing bottlenecks that might result in high costs associated with delivery and returns. Reducing regulatory uncertainty and fostering an inclusive business environment can help small firms trade online and across borders, as well as integrate successfully with larger service providers, such as online platforms.

E-commerce gaps for individuals remain significant along a range of dimensions, including education, income, age and gender, as well as for those living in rural areas. Factors that reduce participation of these groups are often related to economic and social conditions that reach far beyond e-commerce, including rural-urban divides, income distribution, unequal access to education and an aging society. With regard to e-commerce, these conditions may manifest themselves in low connectivity, a lack of digital skills, low levels of trust or a lack of viable payment options, all factors that can be addressed by policy action

1.4 Consumer Behavior in Online Retail

Analyzing consumer behavior and preferences in the context of online retail for renewable energy products.

3.1 Electric power B2B descriptions

The Business-to-Business (B2B) framework within the electric power industry stands as a unique and complex entity, markedly different from the more familiar terrain of consumer focused markets. This distinction is not merely in scale but also in the depth and intricacies of its operations. Predominantly characterized by transactions of substantial magnitude, the electric power B2B sector encompasses a vast array of activities. These range from the procurement of heavy duty equipment in bulk quantities to the formulation and execution of comprehensive contracts that oversee power generation, transmission, and distribution across vast geographical expanses.

The sheer scale and complexity of these transactions give rise to extended sales cycles. Unlike the swift decision-making often seen in B2C scenarios, B2B dealings in the electric power industry are methodical and deliberate. Each transaction, be it a purchase order for machinery or a long-term service contract, undergoes a meticulous process of evaluations. These assessments are not just about cost-effectiveness but also delve into the technical compatibility, long-term viability, and potential scalability of the offerings. Negotiations, often spanning multiple rounds, aim to strike a

balance between commercial interests and operational feasibility. Furthermore, the approval processes are multi-tiered, involving various stakeholders from technical experts and financial analysts to top-tier management, ensuring that every decision aligns with the organization's strategic objectives.

In this industry, the products and services on offer are not generic; they are highly specialized solutions crafted to address specific challenges. Whether it's a state-of-the-art transformer, an advanced grid management system, or consultancy services for renewable energy integration, each product or service demands a deep-seated understanding. Stakeholders must grasp not only the technical specifications but also the broader implications of their choices. This includes potential integration challenges with existing systems, adherence to ever-evolving regulatory frameworks, and ensuring compliance with both local and international safety and environmental standards. In essence, every B2B transaction in the electric power sector is a testament to the industry's multifaceted nature, where commercial, technical, and regulatory considerations converge.

3.2 Notations

In this section, we introduce and define the notations that will be used throughout the methodology. This notation serves as the foundation for understanding the data structures, user behaviors, and item attributes, as well as the collaborative filtering approach we use to recommend products to users.

U: Represents the set of all users in the system. Each user is uniquely identified by an index in this set, N represents the number of the users.

I: Denotes the set of all items available in the system. Similar to users, each item is uniquely identified by an index in this set, M represents the total number of the items.

n: Represents the number of categories for individual product attributes.

m: Represents the number of categories for user behaviors.

$S(u, v)$*:* Represents the similarity between users u and v. This similarity metric is crucial for collaborative filtering, as it determines how similar two users are in terms of their preferences. The basic formula for collaborative filtering is given by Equation 1:

$$rui=\sum v\in US(u,v)rvi \quad (1)$$

O_{ui}, A_{ui}, B_{ui}: these notations denote the order, following, and browsing numbers respectively for user u and item i. They capture different types of implicit feedback from users.

w_o, w_a, w_b: these are the weight ratios associated with order, following, and browsing data respectively. They determine the significance or influence of each type of implicit feedback in the recommendation process. For examples, we can set $w_o = 1$, $w_a = 0.5$, $w_b = 0.5$.

BI_u, NBI_u: these vectors are behavior numbers varying time, representing the bidding and non-bidding behaviors of user u respectively. They capture unique B2B behaviors that are essential for understanding user preferences in the electric power E-commerce domain.

The foundation of this collaborative filtering approach is based on the principle that users who have behaved similarly in the past will continue to have similar preferences in the future. The notations introduced above will be instrumental in formulating and understanding the mathematical models and algorithms we employ in subsequent sections.

1.5 Digital Marketing for Renewable Energy E-commerce

Best practices for digital marketing in promoting renewable energy products and services online Public policies can support the creation of innovative e-commerce business models

As digital transformation progresses, new business models will arise in ways that are difficult to predict, but which also challenge traditional policy frameworks. In particular, some regulatory barriers preserve artificial distinctions between online and offline commerce, even as firms increasingly pursue business models that combine both elements. Where local zoning laws prevent multi-purpose use of brick-and-mortar stores, or planning regulations prevent the development of new last-mile logistic solutions, the potential of e-commerce diminishes.

Regulatory approaches to new e-commerce business models should focus on remaining experimental, transparent and flexible. Experimental regulatory waivers have been successfully used to test new technologies like drones and digital payment mechanisms; future applications for e-commerce could include cryptocurrencies and 3D printing. Existing rules could be made clearer to reduce uncertainty for innovative firms. Policy makers should avoid attempting to regulate particular business models. Instead, they should ensure that particular business functions conform with regulatory frameworks, while better accounting for the interlinkages across business functions.

1.6. Sustainable Practices in E-commerce

driven solutions are revolutionizing retail operations by optimizing supply chain management and e-commerce processes. Ant colony optimization (ACO) algorithms play a crucial role in improving vehicle routing, enhancing delivery speed, reducing costs, and minimizing resource use (Revanna & Al-Nakash, 2023; Ushada et al., 2022). In e-commerce, AI scrutinizes user behavior to track browsing patterns, cart additions, and purchase completions. Neural networks like WaveNet refine sales forecasting by analyzing product descriptions, enabling businesses to predict demand and better manage inventory and marketing (Chen et al., 2024). Moreover, deep learning models process clinical and genetic data for improved medical diagnostics, such as early cancer detection (Kumar et al., 2023). Together, these AI technologies create an efficient, adaptive business ecosystem.

Theme 4: AI-Enhanced Shopping Experience

AI is transforming e-commerce by boosting operational efficiency and customer engagement through personalized shopping experiences (Birau et al., 2023; Subbaiah et al., 2024). Machine learning enhances this by accurately predicting customer churn, enabling effective retention strategies (Lee et al., 2024). AI also automates inventory management, reduces costs, and enhances data security (Birau et al., 2023). AI-driven chatbots improve customer service and facilitate cross-border transactions (Meltzer, 2023). By analyzing social media feedback, AI provides actionable insights that help businesses refine strategies and products (Alotaibi, 2023). These tools reshape consumer behavior, making shopping more personalized and increasing retention and sales for e-commerce.

Implementing sustainable business practices within the e-commerce model for renewable energy.

1.7 Case Studies in Renewable Energy E-commerce:

3.3 Fusion of behavioral data

The fusion of behavioral data is a pivotal step in the methodology, aiming to create a comprehensive representation of user interactions on the platform. This section delves into the intricacies of how different types of behavioral

data are combined to provide a holistic view of user preferences and activities.

3.3.1 Order, following, and browsing data

These three types of data capture the most direct interactions of users with items on the platform. Order data (O_{ui}) represents confirmed transactions, following data (A_{ui}) signifies items that users have shown interest in, and browsing data (B_{ui}) captures the items that users have viewed or explored.

3.3.2 Weight ratios

The weight ratios w_o, w_a, $and w_b$ are crucial in determining the significance of each type of interaction. They allow us to assign varying importance to different behaviors, reflecting the relative impact of each interaction type on user preferences. For instance, a confirmed order might carry more weight than merely browsing an item.

3.3.3 Bidding and non-bidding data

Unique to the B2B E-commerce landscape, bidding (BI_u) and non-bidding (NBI_u) data provide insights into the negotiation and decision-making processes of users. These behaviors, while not directly linked to transactions, offer valuable context about user intentions and preferences.

3.3.4 Behavior vectors

The behavior vectors for bidding and non-bidding data are formulated to capture the essence of these unique interactions. By characterizing user similarity through these vectors, we can better understand the relationships and similarities between users based on their bidding and non-bidding behaviors.

The fusion formula for order, following, and browsing data is given by Equation 2:

$$Fui = woOui + waAui + wbBui \quad (2)$$

This formula ensures that each type of interaction contributes proportionally to the final fused representation based on its assigned weight. A cosine similarity measure is used here to characterize user similarity for the fusion of behaviors, as detailed in Equation 3.

$$Sf(u,v)=\cos(\theta)=Fu\cdot Fv||Fu||||Fv|| \quad (3)$$

For bidding and non-bidding data, we employ a cosine similarity measure to characterize user similarity $S_{bid}(u, v)$, $S_{nb}(u, v)$. This metric captures the angle between the behavior vectors, providing a measure of how alike two users are in terms of their bidding and non-bidding behaviors:

The fusion of behavioral data is a multi-faceted process that combines various types of user interactions to create a unified representation. This representation serves as the foundation for subsequent recommendation processes, ensuring that all relevant user behaviors are considered.

3.4 Fusion of item attribute information

The integration of item attribute information is a cornerstone in the methodology, ensuring that the attributes and characteristics of items are adequately represented and factored into the recommendation process. This section elucidates the methods and rationale behind the fusion of various item related data, highlighting the importance of capturing the multifaceted nature of products in the B2B E-commerce domain.

3.4.1 Item attribute vector

Central to the approach is the concept of item attributes. This vector encapsulates various attributes of an item, such as its category, suppliers and other relevant metadata. For each item and each item attribute (e.g. category), we construct a one-hot-vector based on different values of attributes. Hence, the size of item attribute vector IA related to individual item attribute is $M \times n$.

3.4.2 User behavior matrix

With the item attribute vectors in place, we can then construct the user-attribute behavior matrix. Firstly, the overall user behavior vector $B_{m \times M}$ is established with each element representing the number of specific behavior (e.g., order number) for each item. The m is the number of behavior types and M is the number of items. Secondly, through matrix operations $B_{m \times M} IA_{M \times n}$, we can obtain the user specific-attribute interaction matrix $R_{m \times n}$. Finally, by summing up each column of the matrix, we can obtain a vector representing the behavioral performance of each user for each attribute. Therefore, the user-attribute behavior matrix $M_{N \times n}$ is established. Mapping user behaviors onto the item attribute vectors, we can capture the nuanced interactions between users and the multifaceted attributes of items.

3.4.3 Similarity computation

The fusion of item attribute information and user behavior culminates in the computation of similarity scores. The item-attribute similarity $S_{item}(u, v)$

extracted from $M_{N\times n}$, measure the likeness between two users based on their item attribute information (e.g. item category, suppliers) and the aggregated user interactions (e.g., order, following, browsing). The similarity scores play a pivotal role in the recommendation process, guiding the system toward items that are contextually and attribute wise similar to the user's preferences.

To compute the similarity between users based on their item attribute vectors and user interactions, we employ the cosine similarity metric. In this paper, $S_{item}(u, v)$ is composed of four parts, mainly the three category (primary, secondary and tertiary item category) similarities $S_{itemcategory}(u, v)$ and one supplier similarity $S_{itemsupplier}(u, v)$.

In essence, the fusion of item information is a meticulous process that aims to bridge the gap between raw item attributes and structured data representations. By integrating item characteristics with user behaviors, we ensure that the recommendation system is both context-aware and attribute-sensitive, leading to more accurate and meaningful recommendations.

3.5 Fusion of behavioral data and item information

The recommendation method forms the crux of the approach, leveraging the fused behavioral data and item information to generate personalized product suggestions for users. This section delves into the intricacies of the recommendation algorithm, elucidating the steps and logic that drive the generation of tailored recommendations.

3.5.1 User similarity computation

At the heart of the recommendation method is the computation of user similarity. By comparing the behavior profiles of different users, we can identify patterns and preferences that are shared among them. This similarity metric, denoted as $S(u, v)$, provides a measure of how alike two users are in terms of their interactions and preferences. It serves as a foundation for identifying potential items that might be of interest to a given user, as detailed in Equation 4.

$$S(u,v)=Sf(u,v)+Sbid(u,v)+Snb(u,v)+Sitem(u,v) \quad (4)$$

The elements in similarity matrix $S(u, v)$ vary between 0 and 7. The higher the value in the matrix, the greater the similarity between the related users.

3.5.2 Historical data consideration

A user's historical data plays a pivotal role in shaping recommendations. By analyzing past interactions, purchases, and preferences, we can glean insights into a user's tastes and inclinations. This historical context ensures that the recommendations are not only based on current interactions but also influenced by a user's long-term behavior.

3.5.3 Item ranking

Once user similarities are computed and historical data is factored in, the next step is to rank items based on their relevance to a given user. This ranking process involves scoring items based on their potential appeal to the user, considering both the user's behavior and the item's attributes.

3.5.4 Top-K recommendations

The culmination of this recommendation method is the generation of the Top-K recommendations. These are the K items that have the highest relevance scores for a user. By focusing on the top-rated items, we ensure that users are presented with products that are most likely to align with their preferences and needs.

The recommendation for a user u is formulated as Equation 5:

$$RSu=\{i1, i2, \ldots, iK\} \quad (5)$$

where $i_k \in I$, and K is defined as the mean of historical order number of user u. This formula ensures that the recommended items are those with the highest relevance scores, taking into account both user similarity and item attributes.

In summary, this recommendation method is a multi-faceted approach that synergizes user behaviors, item attributes, and historical data to generate personalized product suggestions. By considering a wide array of factors and employing sophisticated algorithms, we aim to provide users with recommendations that are both relevant and meaningful, enhancing their e-commerce experience.

Examination of successful case studies in renewable energy e-commerce businesses.

1.8 Regulatory Environment for Online Retail in Renewable Energy:

Experiments and discussion

In this section, a real case dataset was utilized to assess the effectiveness of the proposed recommendation model. The case study results demonstrate the proficient performance of the proposed approach.

4.1 Data descriptions

The research presented in this study heavily relies on the rich dataset sourced from Beijing Huadian E-commerce Technology Limited Company, a leading entity in the B2B E-commerce sector of the electric power industry. This meticulously curated dataset, which spans the entire duration of 2022, offers an unparalleled window into the multifaceted interactions of 217 distinct users as they navigate through an extensive catalog of 346,672 products.

At the heart of this dataset lies five pivotal categories of user behavior: order data, following data, browsing data, bidding data, and non-bidding data. Each of these categories, while valuable in its own right, collectively paints a comprehensive picture of user interactions, preferences, and decision-making processes on the platform. The more traditional data types, such as order, following, and browsing data, provide insights into patterns of product discovery, interest, and acquisition. On the other hand, the inclusion of specialized data types like bidding and non-bidding data offers a deep dive into the unique B2B behaviors that set this platform apart from conventional e-commerce platforms. The intricate relationship between bidding activities and order behaviors, for instance, sheds light on the multi-layered negotiation, evaluation, and decision-making phases that often precede a finalized B2B transactio

Understanding the regulatory and compliance landscape impacting e-commerce in renewable energy.

1.9 Future Trends in Online Retail and Renewable Energy

Exploring future trends and innovations at the intersection of online retail and renewable

heme 5: AI-Powered Product Recommendations

AI technologies like collaborative filtering (CF) and recommender systems are transforming e-commerce by providing personalized product suggestions. Integrated into e-commerce platforms, recommender systems help users navigate vast inventories with tailored recommendations based on their preferences and behavior (Jha et al., 2021). By analyzing user data,

these systems improve both user experience and engagement, optimizing recommendation personalization (Zhao, 2023). CF is particularly effective, using insights from multiple users to predict individual preferences based on shared product interactions (Yu et al., 2021). These AI-driven tools give businesses a competitive edge by enhancing user engagement.

Theme 6: Advanced E-commerce Analytics

In the dynamic world of e-commerce, a suite of innovative technologies including big data analytics, data mining, and deep learning is revolutionizing online trading and enhancing customer experiences. At the forefront, big data analytics and data mining are critical for managing large datasets, which help in predicting customer preferences and bolstering decision-making processes (Jeevitha et al., 2023; Mandala et al., 2023). Specifically, data mining technology plays a key role in efficiently extracting vital information from e-commerce platforms, facilitating text retrieval, and analyzing consumption trends to forecast consumer demand and purchasing power (Zhong, 2022). Moreover, deep learning models like “DeepLimeSeg” are enhancing these capabilities further by refining customer segmentation through advanced algorithms, thereby improving the precision and transparency of marketing efforts (Talaat et al., 2023). Collectively, these advanced tools are reshaping e- commerce, facilitating more personalized and efficient interactions that enhance the customer experience.

Theme 7: Customer Support Powered by AI

This theme discusses the strategic utilization of AI-powered chatbots by e-commerce enterprises to elevate customer satisfaction levels, optimize operational processes, and establish a distinctive presence in a fiercely competitive market landscape. Chatbots, functioning as virtual assistants, employ AI and NLP algorithms to engage users, replicate human interactions, and provide efficient responses to inquiries in various industries (Siddig & Hines, 2019). They enhance personalized support, reduce customer service costs through automation, and play a vital role in resolving complaints promptly, leading to increased customer satisfaction (Khan, 2020; Singh et al., 2024). Furthermore, these AI-powered assistants contribute to rebuilding customer trust post-service issues and implementing strategic service recovery measures (Song et al., 2023). In essence, chatbots represent a valuable asset in elevating customer experiences and streamlining service operations in the modern digital era.

These themes collectively demonstrate the transformative impact of AI technologies on various aspects of e-commerce, from personalized recommendations and predictive analytics to enhanced customer service and supply chain optimization. By embracing AI-driven strategies and solutions, e-commerce businesses can stay competitive, drive growth, and deliver superior shopping experiences to customers in today's digital marketplace.

Future Research Frontiers in AI for the E-commerce Sector

The application of the theory, context, characteristics, and methodology (TCCM) framework is essential for comprehensively exploring the multifaceted impact of AI in e-commerce, especially as this field continuously evolves with new technologies and consumer demands. By structuring the study around the TCCM elements, this approach allows for an organized analysis of AI's role in transforming online commerce, enhancing both academic insight and practical implications for industry stakeholders (Paul et al., 2023). The field of AI and e-commerce is evolving rapidly, offering innovative ways to enhance consumer experience, personalize interactions, and drive business growth. However, this rapid growth also brings challenges that require critical examination, particularly concerning consumer trust, ethical considerations, and sustainable engagement. This objective (RQ5) seeks to explore future research prospects in AI-driven e-commerce through the TCCM framework, which provides a comprehensive structure

2.topics :

2.1Publishing and Natural Resources Management:

This Masters-level course is designed to explore the intersection of publishing and the management of sustainable natural resources. It focuses on how publishing can be an effective tool in promoting sustainable natural resources management, raising awareness, and influencing policy and public perception. Students will engage in both theoretical and practical approaches to sustainable communication and publishing strategies, understanding the role of different media in shaping narratives around sustainability and natural resources conservation

2.2 Introduction to Sustainable Natural Resources Management:

This topic covers the fundamental principles of sustainable natural resource management and its importance for future generations.
Challenges in natural resource management for ecological sustainability

Saikat Mondal, Debnath Palit, in Natural Resources Conservation and Advances for Sustainability, 2022

2.3.1 Resource planning strategy and ownership regime

NRM strategies can be classified by the form and interest of the stakeholders:

(a)

State property regime

Power and control of resource usage have been in the possession of the State. Any person can also use the resources, but only with the state's consent. Some examples are the national forest, national parks and military reserves.

(b)

Private property regime

Any properties owned by an established corporate or individual organization. The owner(s) are responsible for both the advantage and the responsibilities to the resources. The most prominent example is private property.

(c)

Common property regimes

It’s a group’s private ownership. The scale, complexity and structure of the group can differ, e.g., aboriginal community, village neighbor. Public parks, grasslands and water resources are few examples.

(d)

Nonproperty regimes

Such assets do not have a definitive owner. Each prospective consumer has the sam

Natural Resource Management (NRM) refers to the sustainable utilization of major natural resources, such as land, water, air, minerals, forests, fisheries, and wild flora and fauna. Together, these resources provide the ecosystem services that provide better quality to human life. Natural resources provide fundamental life support, in the form of both consumptive and public-good services. Ecological processes maintain soil productivity, nutrient recycling, the cleansing of air and water, and climatic cycles.

Biological diversity (biodiversity) is the occurrence of different types of ecosystems, different species of organisms with the whole range of their variants and genes adapted to different climates, and environments along with their interactions and processes. Biodiversity encompasses the variety of all life on earth. India is one of the 17 mega-biodiversity countries of the world. Although India has only 2.5% of land area, it has a large pool and diverse pool of plants and microbes which accounts for 7.8% of recorded species in the world. Genetic diversity describes the variation in the number and type of genes as well as chromosomes present in different species. The magnitude of variation in genes of a species increases with increase in size and environmental parameters o

2.3 The Role of Publishing in Sustainability:

Explore how different publishing platforms can be used to promote sustainability and educate the public on environmental issues. ong-term sustainability must be a primary goal for any academic publisher. Without it,

knowledge published in journals, books and other formats risks being damaged or lost. If

one step in a series of research disappears, it casts doubt on subsequent work. Publishers,

as disseminators of verified research, have a responsibility to ensure that published

works remain available for future generations.

2 The aim of this paper is to present the point of view of a commercial open access

publisher with regards to sustainability in the current publishing landscape. We briefly

outline salient points from the history and current state of electronic publishing. The

emphasis is on sustainability, and covers both the development of open access and the

story of MDPI. We then move on to some current projects arising from our focus on

sustainability. Putting sustainability at the heart of publishing activities is an imperative

and in the age of electronic publishing new options are emerging that this goal make it

easier to achieve. There are concrete steps that can be taken by any academic publisher

to ensure the sustainability, preservation, and effective dissemination of knowledge.

3 MDPI sees two primary aspects to sustainability. The first pertains to the preservation of

knowledge. Knowledge creation without sustainability makes little sense. New discoveries

builds on older research, which must be archived and preserved, or what comes after it

does not have a firm foundation. The second strand is MDPI’s view that open propagation

of knowledge will enhance mankind’s future and preserve our environment. The founder

of MDPI, Shu Kun Lin, built the company in the belief that advances in research are a key

contributor to solving many of the most pressing needs of our age, including over-use of

the world’s resources and the threat of climate change. The implementatio

2.4 Environmental Journalism and Communication

Learn the techniques and ethics of reporting on environmental issues, and how this impacts public awareness and policy-making.

2.5 Digital Publishing and New Media

Analyze the role of digital publishing and social media in shaping discussions and actions regarding sustainability.

2.6 Content Creation for Natural Resource Management

Discover practices for creating engaging content that effectively communicates the importance of sustainable natural resource management.

2.7 Policy Advocacy and Public Engagement: xploration. The platform further provides a weekly summary of SDG topics and progress that allow researchers to quickly scan through a collection of papers and determine their relevance. Cactus Communications is developing this technology further to support researchers, institutions, publishers and policymakers in recognizing SDG-relevant research.

Springer Nature has also released 17 SDG Content Hubs with the goal of connecting researchers addressing SDG challenges with policymakers and business practitioners. By enhancing the visibility of SDG publishing activities through the content hubs, they aim to connect the key communities needed to drive global progress.

The RELX SDG Resource Center is another example that aims to aid researchers and the public by giving them access to critical content that builds understanding about the SDGs. The resource center hosts multiple initiatives like annual events, podcasts, in-depth reports, SDG News Tracker (by LexisNexis Newsdesk) and key research published by Elsevier, all under one roof.

2.2. New journals on SDG-relevant topics

In recent years, many academic publishers have increasingly focused on issues related to sustainable development, aligning with global priorities of the SDGs. For example, PLOS has expanded their Open Access portfolio to include more focused journals like PLOS Climate and PLOS Global Public Health, which directly address environmental sustainability and global health challenges. Similarly, Springer Nature has launched several specialized journals such as Nature Food, Nature Sustainability, Nature Energy, and Nature Water. These journals aim to foster interdisciplinary research that drives innovation in food security, sustainable resource management, renewable energy, and water conservation, critical areas underpinning the SDGs.

Furthermore, the trend towards open access publishing has been instrumental in democratizing knowledge and fostering inclusivity in scientific discourse. Springer Nature's Discover series, including Discover Cities, Discover Oceans, Discover Energy, and Discover Sustainability, exemplifies this shift by offering a fully open access (OA) platform for researchers across the globe. By publishing Open Access, these journals are dedicated to reaching a broader audience of policymakers, global scholars, and the public. Additionally, platforms like ScienceOpen have introduced journals such as the Journal of Disability Research published by the King Salman Center for Disability Research, which contributes to SDG goals like reducing inequalities. ScienceOpen also provides publishing solutions for local journals like the Nigerian Journal of Tropical Engineering or the Journal of Ecological Society from Pune, India. These initiatives reflect a growin

Learn about the strategies for using publishing to advocate for policies supporting sustainable natural resources management.

2.8 Sustainable Practices in Publishing:

he paradoxical nature of the open access movement has been widely acknowledged. What started as a movement that was to make research open and accessible to all, ensuring equitable participation, might have just contributed to creating more inequalities. The open access publishing models, largely still relying on Article Processing Charges (APCs), have indeed opened access to readers, at the same time closing it for authors unable to pay the ever-rising fees [2]. Several publishers took active steps towards reviewing their business models to create approaches that would deliver on the Open Science promise [3].
At PLOS, we experiment with business models that aim to forge a truly inclusive publishing environment and remove financial barriers to authors and institutions. We do so by listening to the communities and developing models that address specific needs. And we do it through trial and error: launching pilot models like Community Action Publishing (CAP). With it, we tackled the question of selective journals. Selectivity does not have to mean that costs become huge, and it does not need to perpetuate exclusion. To show that selectivity is possible without high APCs and to move beyond a model that is built on 'articles'. This model aims to eliminate author APCs to make our most selective Open Access journals truly open to read

Explore how publishing companies are adopting sustainable practices to minimize their environmental impact.

2.9. Case Studies in Effective Sustainability Communication:

group recognizes the challenges faced by all stakeholders – researchers, funders, institutions, and publishers – in navigating the current OA landscape. They aim to address the perverse incentives and administrative burdens associated with APCs and explore sustainable, inclusive alternatives. The goal is to move towards an equitable OA model that supports diverse research outputs and fosters Open Science practices. This initiative aligns with broader efforts to make OA more inclusive and equitable, reducing reliance on APCs and transformative agreements that benefit only a few large publishers.

The group, which includes librarians, funders, and publishers, aims to develop models that do not rely on APCs, recognizing their unfairness and limitations. Initial discussions revealed that merely identifying equitable models is insufficient, leading to the development of a framework to assess the equity of various business models. Inspired by SPARC's "How Open is

it?", this "How equitable is it?" framework will use a set of questions to evaluate and benchmark business models based on equity criteria. This approach allows institutions, publishers, and funders to assess and promote equitable participation in research. The framework focuses on criteria such as eliminating financial barriers, ensuring fee transparency, and promoting open research practices. This model-agnostic framework empowers stakeholders to determine the equity of different OA arrangements effectively. The framework, as of June 2024 in its first draft form, after review, shall be released to the community later this year.

3.3. Equity recommended

The Open Access Scholarly Publishing Association (OASPA) presents yet another take on addressing the issue of equity. As they strive to hear all the voices of stakeholders from diverse geographical and economic contexts, they devoted 2023 to workshops and feedback sessions dedicated specifically to the notion of equity in open access publishing. OASPA defines equity in OA as addressing both financial barriers to publishing and ensuring inclusive engagement models, advocating for the removal of author-facing fees to make OA accessible to all researchers. Their research highlighted that publication charges hinder many authors globally, suggesting that current pay-to-publish models only benefit a minority. OASPA aims to shift towards OA by default, where all content is freely accessible without author fees, though acknowledging this requires sustainable financial models. Based on their research they have now formulated a set of recommendations to increase equity in open access. OASPA is currently asking for the community's feedback on the first draft of this document.

Regardless of what concrete steps the scholarly communications community chooses to take to address the question of equity, it is vital to realize that this is not a one-person job. The success of the SDG blueprint relies on collaborative, cumulative commitment coming from all stakeholders in the scholarly communications sector: researchers, publishers, funders, librarians, policymakers and more. On a global scale, beyond our small academic publishing circle, it relies on global cumulative action, with all on board.

4. Translating research into practice

Charlie Rapple, Co-founder, Kudos (growkudos.com)

Part of the challenge of achieving the SDGs is that they require grassroots change. Sustainability can be encouraged via top-down government interventions, but only mass attitudinal and behavioural change will ‘move the needle’ for a lot of the goals. This means more people need to be aware of the goals, and to be persuaded to take action. This is something that we in the scholarly community are well placed to support. We have an important role to play in filling the knowledge gap, helping people around the world to understand the evidence that has shaped the goals, and the research that underpins recommended actions. This breaks down into three areas: cognitive accessibility, discoverability, and user experience.

4.1. Cognitive accessibility

Traditional scholarly communications, such as research articles, monographs, even textbooks, are not designed for influencing broad audiences. But they do provide the basis for telling persuasive stories around research: adding context (real-world examples of challenges being faced by communities or environments) and fleshing out the potential impact (how things could improve if the research was put into practice). Some examples include:

•

Adding plain language summaries to research publications - explaining what the research is about and why it is important helps more people understand it; plain language summaries are also much more easily translated for speakers of other languages.

•

Communicating research visually - many of those who are affected by the SDGs, or who need to act differently if the SDGs are to be achieved, do not have high levels of literacy. Infographics, videos, and other multimedia interpretations of research findings can help maximize the audience for research.

•

Audience briefings - providing recommendations for different groups, such as policymakers, healthcare practitioners, educators and industry can help expedite change by more clearly setting out wh

Analyze real-world examples where effective communication and publishing have contributed to successful sustainable resource management.

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3 topics :

3.1 Masters in Supply Chain Management and Traceability

This course is designed for students pursuing a Master's degree, focusing on the integration of software engineering principles with supply chain management and traceability. The course explores how modern software solutions can enhance supply chain efficiency and transparency, leveraging advanced technologies to ensure the seamless traceability of goods from origin to consumer. Students will gain an in-depth understanding of the design and implementation of traceability systems within complex supply chains.

3.2 Introduction to Supply Chain Management

An overview of the basic concepts and components of supply chain management, focusing on the flow of goods, information, and finances.

he way in which companies have conducted, managed, controlled and integrated their

business operations have experienced dramatic changes during the last couple of years –

this is especially true in the worldwide recording and music industries. Rapid advances

in technology and increasing regulatory freedom have changed the rules of operation

and competition. Businesses are now competing globally and traditional barriers

between industries are breaking down. To cope with these and other changes and

achieve superior performance, business leaders are moving towards new business

paradigms that allow their companies to work more closely together with their

traditional and new business partners (which include all clients and suppliers up and

down the supply chain), in order to adapt to the rapidly changing marketplace.

As discussed in the fourth chapter under point 4.2, it is proposed by the mentioned

authors that this new collaboration can be successfully achieved by outsourcing all non-

core business activities to a third party business partner, which in turn will lead to an

improved integration through supply chain management. As companies focus on their

core activities and outsource the rest, their success increasingly depends on their ability

to control what happens in the value chain outside their own boundaries (Magretta

2000: 29 - 59). Supply chain leaders are thus reconsidering the linkages, not only

between functions within their own companies, but also with other
An Introduction to Supply Chain Management
This free online course helps you manage your supply chain operations and processes successfully.

Supply chain management is one of the many new management tactics that have emerged and rapidly developed across different industries worldwide. This course will help you understand supply chain systems, logistics and customer response principles. We explore global supply chain operations, warehouse management and the latest business concepts to help you improve your supply chain processes and boost your business' productivity.

3.3. Principles of Traceability

Understanding the importance of traceability in the supply chain, and how it ensures product integrity, safety, and compliance.

3

change and increasingly complex and global supply chains have created huge

challenges for all participants. Traditional channel structures and behaviours in the

industry's supply chains have not kept pace with these changes. In the markets of the

future, comprehensive management which collaborate the supply chain as a whole is

needed to fulfil the new demands set by players and consumers alike.

The hypothesis statement of this thesis is in part derived from the problem statement.

This hypothesis statement is discussed in the research methodology in Chapter 5 under

point 5.3.3 and is stated as follows:

“Record Companies in the South African Recording Industry should outsource

all their non-core business activities to one strategic business partner.”

It is clear to see how this statement is derived from the problem statement of this thesis,

as described here in point 1.1.1. This statement, as well as the opportunities and

problems it may present, is the core around which this thesis cent

3.4 Software Engineering Basics:

Introduction to software engineering principles and methodologies that are applicable to the development of supply chain management systems.:9
(c) The study design
The design of the research study was drafted in accordance with the prescribed
methodology of a proper research proposal that were explained in point 1.2.1.1
above.
(d) Sampling and data capturing
Sampling and data capturing of all information gathered from research as well as
from interviews with targeted players in the recording industry are utilised. Employees of record companies, music dealers, compact disc manufacturers and
supply chain management (SCM) companies were contacted and interviewed
through personal interviews, telephone conversations and electronic mails (refer
to the details of the respondents in Chapter 5 under point 5.4.3).
(e) Information evaluation

All researched data were scrutinised and reduced to a manageable quantity, where after it was used to develop summaries, conclusions and ultimately the
new MODEL C in the last chapter.
(f) Information analysis
The gathered data and information were analysed, assigned with qualitative and
quantitive values and then interpreted

3.5 Supply Chain Digitalization

Exploring the role of digital technologies and software in transforming traditional supply chains into digital networks. The impact of change on logistics systems

Change can either be viewed as a thorny management issue, or as an important

competitive advantage. For logistics practitioners, change comes in many forms, for

example faster order cycle times, increasingly differentiated products and services and

ever more sophisticated technologies to help manage all of this complexity. One

consequence of these changes is the need for more dynamic and responsive logistics

systems that can readily adapt and respond to the changing needs and requirements.

This study will aim to prove that the key to mastering change as a competitive weapon

has two equally important facets: firstly the development of internal company

capabilities and competencies necessary to be truly productive, profitable and flexible,

and secondly to develop linkages and partnerships in the supply chain in order to reap

the optimum benefits of the logistics or supply chain management process.UUnniivvee rrss iittyy ooff PP rree ttoorriiaa ee ttdd –– SS ttee yynn,, MM MM ((22000055))

14

A logistics system can be termed a competitive advantage only to the extent that it

provides customers with products and services that they want or need, when they want

or need them. Once customer services strategies are identified, marketing and

distribution channels must be designed to perform to the required standards. Analytical

tools can be used to optimally allocate and deploy financial and human resources to

achieve desired levels of service in a logistics network. Preparing the business for

change and doing things differently, may be th

3.6 Data Management in Supply Chains

Understanding the importance of data management and analytics in optimizing supply chain operations and improving traceability.:

3.7 Blockchain for Supply Chain Traceability

Exploring the use of blockchain technology to enhance transparency and traceability in supply chains.

IoT and Smart Supply Chains

Investigating how the Internet of Things (IoT) enables real-time data collection and smart decision-making in supply chains.

3.8 Security and Privacy in Supply Chain Software:

Addressing the challenges of ensuring data security and privacy in supply chain management software solutions. onnectivity

The more people or businesses work together in a network or in a supply chain,

the higher the value of that network becomes. Internal connectivity as well as

connectivity to the outside world must not be rated as purely sufficient, but must

be seen to offer added value. In order to successfully manage either knowledge,

change, transformation or any other organisational issue, there needs to be

connectivity in the channel. Both connectivity (‘point b’ above) as well as speed

(discussed in ‘point c’ below) are needed to extract value from the above-

mentioned knowledge (in ‘point a’ above).

(c) Speed

Speed to market is vital. Getting the latest music release sold and delivered into

the trade and onto shop shelves before the competition will ensure at least an

initial market dominance. Just as important is speed of communication to

customers and suppliers (i.e. successful marketing as is discussed in Chapters 3

and 6). Most businesses operate in real time and need the correct and relevant

information available at the click of a button. This is one of the main advantagesUUnniivvee rrss iittyy ooff PP rree ttoorriiaa ee ttdd –– SS ttee yynn,, MM MM ((22000055))

3.9 Case Studies and Real-world Applications

Analyzing real-world cases of supply chain management and traceability using software solutions. Reduced risk

Reduced risk accompanied by an increase in certainty of demand can be

achieved. The more information gathered for the forecast (be it from the sales

and marketing team, or via the operations department), the lower the risk of

receiving unprepared-for orders becomes.

(b) Calculation of danger stock levels

By planning ahead and being aware of future orders, a company will be able to

calculate its needed stock levels. A reduction in inventory levels, which in turn

holds significant capital benefits, will be achieved by implementing the

information gained through the forecast.

(c) Production and human resource planning

Fewer staff will be needed to cover demand peaks, for example during the very

busy Christmas holiday shopping season when record companies usually

achieve their highest sales figures (refer to the sales graphs in Annexures C and

D at the end of the thesis). If the forecasting system is accurate, these increased

levels of demand can be anticipated and adequately planned for. The high

amounts of money, which usually needs to be spent on paying over-time

salaries, can then be drastically reduced.

(d) Better demand planning

A definite improvement in the visibility of the customer or the end-user's

demand can be obtained. By collaborating the research and experience of all

divisions (operations, sales and marketing), a better idea can be formed of what

the needs of customers will be like in the future. This will lead to better planning

through the use of an improved forecasting system.

(e) Improved customer service

Improved customer service will be a direct result

Topics 4.

4.1 Social Media Marketing for Real Estate, Rental, and Leasing

This course is designed to equip students with the skills and knowledge required to effectively leverage social media platforms for the marketing of real estate, rental, and leasing businesses. Students will learn to create engaging content, manage social media campaigns, and analyze performance metrics specific to the real estate sector.: It sounds like you have a curriculum outline! Are you looking to develop more details for these sections, or perhaps create some engaging content for the course? Here are a few ideas to expand on each topic:

4.1 Social Media Marketing for Real Estate, Rental, and Leasing

4. **Creating Engaging Content**
    - Techniques for capturing high-quality photos and videos of properties.
    - Writing compelling property descriptions and posts.
    - Utilizing virtual tours and 3D walkthroughs to enhance listings.
5. **Managing Social Media Campaigns**

- Strategies for targeting the right audience on platforms like Facebook, Instagram, and LinkedIn.
- Best practices for scheduling posts and maintaining consistency.
- Leveraging paid advertising and promotions to boost visibility.

6. **Analyzing Performance Metrics**
   - Key performance indicators (KPIs) specific to real estate, such as engagement rate, click-through rate (CTR), and lead generation.
   - Tools and software for tracking and reporting metrics.
   - Case studies and real-world examples of successful social media campaigns in real estate.

4.2 Introduction to Social Media Marketing

5. **Overview of Social Media Platforms**
   - Introduction to major platforms: Facebook, Instagram, Twitter, LinkedIn, TikTok, etc.
   - Understanding the unique features and audiences of each platform.
6. **Creating a Social Media Strategy**
   - Setting goals and objectives for social media marketing.
   - Identifying target audiences and crafting buyer personas.
   - Developing a content calendar and scheduling posts.
7. **Content Creation and Management**
   - Types of content: images, videos, stories, live streams, etc.
   - Tools and apps for creating and editing social media content.
   - Best practices for engaging and interactive posts.
8. **Analyzing and Optimizing Performance**

- Using analytics tools to measure success and ROI.
- Understanding key metrics and how to interpret them.
- Strategies for continuous improvement and staying up-to-date with trends.

I hope these ideas help you build out your course! Let me know if you need any more assistance or specific details.

4.2 Introduction to Social Media Marketing

Understanding the basic concepts of social media marketing and its importance in the real estate, rental, and leasing sectors.:

Understanding the Basic Concepts of Social Media Marketing

Social media marketing involves using platforms like Facebook, Instagram, Twitter, LinkedIn, and TikTok to promote products, services, or brands. The goal is to engage with potential customers, build relationships, and drive traffic to your website or listings.

Key Concepts:

- **Content Creation:** Developing engaging and relevant content that resonates with your target audience. This can include images, videos, blog posts, and infographics.
- **Audience Engagement:** Interacting with your followers through comments, messages, and posts to build a community and foster loyalty.
- **Analytics and Metrics:** Monitoring the performance of your social media campaigns using tools like Facebook Insights, Instagram Analytics, and Google Analytics. Key metrics include engagement rate, click-through rate (CTR), and conversions.
- **Advertising:** Utilizing paid advertising options on social media platforms to increase visibility and reach a broader audience. This includes sponsored posts, display ads, and retargeting campaigns.

Importance of Social Media Marketing in Real Estate, Rental, and Leasing

Social media marketing is especially important in these sectors because:

- **Visual Appeal:** Real estate relies heavily on visual content. High-quality photos, videos, and virtual tours of properties can attract potential buyers or renters.
- **Targeted Advertising:** Social media platforms allow you to target specific demographics, such as location, age, income level, and interests. This ensures your listings reach the right audience.
- **Brand Building:** Consistent and engaging social media presence helps build your brand's reputation and trustworthiness in the market.
- **Lead Generation:** Social media can be a powerful tool for generating leads. By engaging with your audience and providing valuable content, you can attract potential buyers or renters.
- **Cost-Effective:** Compared to traditional marketing methods, social media marketing can be more cost-effective and offer a higher return on investment (ROI).

By understanding these concepts and recognizing the importance of social media marketing, you can effectively promote your real estate, rental, or leasing business and stay competitive in the market.

Let me know if there's anything specific you'd like to explore further!

4.3 Target Audience Analysis

Identifying and understanding the target audience for real estate, rental, and leasing businesses on social media platforms.

4.4 Content Creation for Real Estate

Strategies for creating compelling content that attracts and retains the interest of potential clients on social media.: Target Audience Analysis for Real Estate, Rental, and Leasing on Social Media

Identifying and understanding your target audience is crucial for creating effective social media marketing strategies. Here's how you can analyze your target audience in the real estate, rental, and leasing sectors:

1. Define Demographics

- **Age:** Identify the age groups most interested in buying, renting, or leasing properties. For example, millennials might be looking for first-time homebuying opportunities, while older generations might seek investment properties.
- **Location:** Focus on geographic areas where your potential customers are located. This could be specific cities, neighborhoods, or regions.
- **Income Level:** Determine the income bracket of your target audience to match them with appropriate properties.
- **Family Status:** Consider whether your audience includes singles, young couples, families, or retirees.

2. Understand Psychographics

4.5 Platform-Specific Strategies:

Learning to tailor marketing strategies for different social media platforms such as Facebook, Instagram, and LinkedIn.: Platform-Specific Strategies for Social Media Marketing

Tailoring your marketing strategies to different social media platforms is essential for maximizing engagement and reaching your target audience effectively. Here's how you can craft platform-specific strategies for Facebook, Instagram, and LinkedIn:

Facebook

3. **Audience Targeting**
    - Utilize Facebook's detailed targeting options to reach specific demographics, interests, and behaviors.
    - Create custom audiences based on your existing customer data and lookalike audiences to find new potential clients.

4. **Content Strategy**
    - Post a mix of engaging content, including property listings, client testimonials, industry news, and educational posts.

4.6 Social Media Advertising:

An overview of social media advertising options and best practices for real estate marketers.: **Facebook Ads**

- **Ad Formats:** Image ads, video ads, carousel ads (multiple images or videos), slideshow ads, collection ads (with an instant experience), and lead generation ads.
- **Targeting:** Demographic targeting, interest targeting, behavioral targeting, custom audiences (based on your own data), lookalike audiences (similar to your existing customers).
- **Placement:** Facebook Feed, Instagram Feed, Stories, Messenger, Audience Network.

 Instagram Ads

- **Ad Formats:** Photo ads, video ads,

Engagement and Community Building:

Techniques for engaging with followers and building a community around your real estate brand.

Metrics and Analytics: Engagement and Community Building

Building a strong community around your real estate brand is crucial for long-term success. Here are some techniques to engage with followers and foster a sense of community:

Techniques for Engaging with Followers

4. **Consistent Posting**
    - Post regularly to keep your audience engaged and informed. Use a content calendar to plan and schedule posts.

- Share a mix of content types, including property listings, market updates, client testimonials, and behind-the-scenes looks.

5. **Interactive Content**
    - Use polls, quizzes, and questions to encourage interaction.
    - Host live Q&A sessions or virtual tours to engage with your audience in real-time.
6. **Personalization**
    - Respond to comments and messages p

Understanding social media metrics and utilizing analytics tools to measure and enhance campaign performance.

2. Brand Reputation Management: **Transparency**
    - Be transparent about your business practices and any changes or updates.
    - Transparency builds trust and fosters a positive reputation.

Case Studies and Best Practices

Learning from successful social media marketing campaigns can provide valuable insights and inspiration. Here are a few best practices:

4. **Real Estate Case Study: Zillow**
    - **Strategy:** Zillow uses high-quality images and videos, informative articles, and market data to engage its audience.
    - **Success:** They have built a large and engaged following, positioning themselves as a trusted source of real estate information.
5. **Rental Property Case Study: Airbnb**
    - **Strategy:** Airbnb leverages user-generated content, such as guest photos and reviews, to build trust and showcase properties.

- **Success:** They have created a sense of community among hosts and guests, resulting in high engagement and loyalty.

6. **Leasing Business Case Study: WeWork**

    - **Strategy:** WeWork uses professional content, case studies, and success stories to highlight the benefits of their coworking spaces.

    - **Success:** They have established a strong brand presence and attracted a large audience of professionals and businesses.

By implementing these techniques and strategies, you can effectively engage with your followers, build a strong community around your real estate brand, and maintain a positive reputation on social media platforms.

If you need more detailed information or examples, feel free to ask!

Strategies for managing and maintaining a positive brand reputation on social media platforms.

4.6 Case Studies and Best Practices

Examining successful social media marketing campaigns in the real estate sector and identifying best practice

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5.1 Advanced Telemedicine and Remote Healthcare Production

This course is designed for Master's students focusing on the integration of telemedicine and remote healthcare with media production in radio and television. It aims to equip students with the skills and knowledge necessary to produce informative, engaging, and impactful media content that addresses the growing field of telemedicine and remote healthcare delivery. This interdisciplinary course will cover media production techniques, storytelling, healthcare technologies, and ethical considerations in telehealth broadcasting.

5.2 Introduction to Telemedicine and Remote Healthcare: Advanced Telemedicine and Remote Healthcare Production

This course is tailored for Master's students who aim to integrate telemedicine and remote healthcare with media production in radio and television. The course equips students with the skills and knowledge to produce impactful media content in the rapidly growing field of telemedicine and remote healthcare delivery.

Key Topics:

3. **Media Production Techniques**
    - Basics of video and audio production.
    - Advanced editing techniques.
    - Production of live broadcasts and pre-recorded shows.
4. **Storytelling for Healthcare**
    - Crafting compelling stories around telehealth services.
    - Techniques for simplifying complex medical information for a general audience.
    - Use of patient testimonials and case studies.

Understanding the fundamentals of telemedicine, its history, current trends, and the potential impact on healthcare delivery.

5.3 Television and Radio Production Essentials:

Fundamental techniques in radio and television production including scriptwriting, audio/visual recording, editing, and broadcasting.: **Healthcare Technologies**

- Overview of telemedicine technologies: video conferencing tools, remote monitoring devices, and telehealth platforms.
- Integration of these technologies into media production.

 Ethical Considerations in Telehealth Broadcasting

- Privacy and confidentiality in telemedicine.
- Ethical dilemmas in telehealth storytelling.

- Regulations and guidelines for telehealth content production.

5.4 Medical Narrative and Storytelling

Crafting compelling stories that communicate complex healthcare concepts effectively to a diverse audience.: 5.3 Television and Radio Production Essentials

An introduction to the fundamentals of television and radio production, focusing on skills necessary for creating high-quality media content.

Key Topics:

4. **Television Production Basics**
    - Camera operation and techniques.
    - Lighting and sound design.
    - Directing and producing TV segments.
5. **Radio Production Basics**
    - Audio recording and editing.
    - Scriptwriting for radio broadcasts.
    - Hosting and interviewing techniques.
6. **Advanced Production Skills**

5.6 Remote Healthcare Technologies and Innovations:

Exploring the latest telehealth technologies, including devices, software platforms, and innovations that enable remote healthcare.

3. 5.7 Ethical and Legal Considerations in Telehealth Media: **dvanced Production Skills**
    - Multi-camera setups and live broadcasting.

- Post-production editing and special effects.
- Integrating graphics and animations.

4. **Production Software**
    - Familiarity with industry-standard software like Adobe Premiere, Final Cut Pro, and Audacity.
    - Best practices for efficient and effective media production.

These topics and courses will provide students with a comprehensive understanding of telemedicine and remote healthcare, along with the skills to produce engaging and informative media content.

If you need more details or have specific questions about any of these sections, feel free to let me know!

Understanding the ethical and legal implications of broadcasting telemedicine content, including patient privacy and data protection.

5.8 Producing Engaging Content for Healthcare: reating captivating and informative healthcare content for radio and television requires a blend of creativity, storytelling, and technical skills. Here are some techniques and strategies:

3. **Storytelling Techniques**
    - **Personal Narratives:** Use patient stories and testimonials to humanize healthcare topics and create emotional connections with the audience.
    - **Simplifying Complex Information:** Break down medical jargon into understandable language using analogies and visuals.
    - **Engagement Hooks:** Start with a compelling hook, such as an intriguing fact, question, or scenario, to grab the audience's attention.

4. **Visual and Audio Elements**

- **High-Quality Production:** Invest in good lighting, sound, and camera equipment to ensure professional-looking and sounding content.
- **Visual Aids:** Use graphics, animations, and infographics to illustrate complex concepts and data.
- **Sound Design:** Use background music

Techniques and strategies for producing engaging and educational healthcare content for radio and television.

5.9 Audience Engagement and Feedback in Healthcare Broadcasting

Tools and methods for measuring and analyzing audience engagement and feedback to improve healthcare programming.

5.10 Case Studies and Best Practices: Reviewing successful telemedicine and remote healthcare media projects can provide valuable insights and inspiration. Here are some best practices and case studies:

5. **Case Study: Mayo Clinic**
   - **Overview:** The Mayo Clinic produces high-quality video content featuring expert interviews, patient stories, and educational segments.
   - **Success Factors:** Professional production quality, clear and concise information, and a focus on patient-centered care have contributed to their success.
6. **Case Study: Cleveland Clinic**
   - **Overview:** Cleveland Clinic utilizes live streaming for virtual health talks and Q&A sessions with medical experts.
   - **Success Factors:** Interactive content, real-time engagement, and collaboration with healthcare professionals have enhanced their reach and credibility.
7. **Case Study: BBC Health Check**

- **Overview:** BBC's "Health Check" program provides in-depth coverage of global health issues with expert analysis and field reports.
- **Success Factors:** Comprehensive research, diverse perspectives, and high journalistic standards have made the program a trusted source of health information.

8. **Best Practices**
    - **Research-Driven Content:** Base your content on thorough research and verified information to ensure accuracy and reliability.
    - **Audience-Centered Approach:** Focus on the needs and interests of your audience to create relevant and engaging content.
    - **Continuous Improvement:** Regularly review and analyze feedback and performance metrics to refine and enhance your programming.

These strategies and case studies can help you produce engaging and educational healthcare content, effectively measure audience engagement, and maintain a positive brand reputation in telemedicine and remote healthcare broadcasting.

If you need more details or have specific questions, feel free to let me know!

Review and analysis of successful telemedicine and remote healthcare media projects and their production processes.

5.11 Future Trends in Telemedicine and Media Integration

Exploring future trends in telemedicine and how media can adapt to new healthcare delivery models.

Topics 6

6.1 Technical Writing for Technology

This course is designed to prepare students with the skills and knowledge necessary to effectively communicate complex technical information. Through a blend of theory and practical application, students will learn how to write manuals, guides, and reports in a way that is clear, concise, and accessible to various audiences within the technological field.

6.2 Introduction to Technical Writing

An overview of technical writing, its significance in the tech industry, and the roles and responsibilities of a technical writer.: Key Topics:

3. **Fundamentals of Technical Writing**
    - Understanding the purpose and scope of technical writing.
    - Characteristics of effective technical documentation.
    - Writing for different audiences: experts, technicians, and laypersons.
4. **Writing Manuals and Guides**
    - Structure and components of user manuals and guides.
    - Techniques for breaking down complex processes into simple steps.
    - Use of diagrams, flowcharts, and other visual aid

6.3 Understanding Your Audience:

Learn how to identify and write for different audience levels, ensuring your writing is accessible and understood by your intended readers.: **reating Technical Reports**

- Types of technical reports: feasibility reports, progress reports, and research reports.
- Organizing and structuring technical reports.

- Writing clear and concise executive summaries, conclusions, and recommendations.

Documenting Software and Hardware

- Writing API documentation and software user guides.
- Creating installation guides and troubleshooting manuals for hardware products.
- Techniques for ensuring accuracy and clarity in technical documentation.

Editing and Proofreading

- Best practices for editing and proofreading technical documents.
- Common errors and how to avoid them.
- Tools and software for technical editing and proofreading

6.4 Research and Information Gathering: **Primary Data Sources**

- **Interviews:** Conduct interviews with subject matter experts (SMEs), stakeholders, and users to gather firsthand information.
- **Surveys and Questionnaires:** Distribute surveys and questionnaires to collect data directly from your target audience.
- **Observations:** Observe processes, product usage, and workflows to gain a better understanding of the subject matter.
- **Experiments and Testing:** Conduct experiments or tests to gather empirical data.

Secondary Data Sources

- **Literature Review:** Review existing literature, such as academic papers, books, and industry reports, to gather background information and context.
- **Online Databases:** Use online databases like PubMed, IEEE Xplore, and Google Scholar to find relevant research articles and publications.

- **Industry Websites and Blogs:** Follow reputable industry websites, blogs, and forums to stay updated on the latest trends and developments.
- **Company Documentation:** Refer to internal documentation, such as technical specifications, user manuals, and whitepapers, to gather re

Techniques for conducting research and gathering information, including primary and secondary data sources.

6.5 Document Design and Formatting: **Layout**

- **Structure:** Organize content logically with clear headings, subheadings, and sections.
- **Whitespace:** Use adequate whitespace to prevent clutter and improve readability.
- **Alignment:** Ensure consistent alignment of text, images, and other elements.

 Typography

- **Font Choice:** Select legible fonts that are easy to read on both screen and print. Avoid using too many different fonts.
- **Font Size and Style:** Use appropriate font sizes and styles for headings, subheadings, and body text to create a clear hierarchy.
- **Line Spacing:** Use adequate line spacing to make the text more readable.

 Visuals

- **Images and Diagrams:** Include relevant images, diagrams, and charts to illustrate complex concepts and data.
- **Captions and Labels:** Provide clear captions and labels for all visuals to enhance understanding.
- **Consistency:** Maintain consistent formatting and styling for all visuals throughout the document.

Explore the principles of effective document design, including layout, typography, and the use of visuals to aid understanding.

6.7 Writing Manuals and Guides: Writing effective instructional materials, such as user manuals and guides, requires clarity and precision. Here are some methods:

4. **Understand the Audience**
    - **Identify Needs:** Determine the needs and skill levels of your audience to tailor the content accordingly.
    - **User Personas:** Create user personas to represent different types of users and their requirements.
5. **Structure and Organization**
    - **Table of Contents:** Provide a clear and comprehensive table of contents for easy navigation.
    - **Step-by-Step Instructions:** Break down processes into simple, sequential steps. Use numbered lists and bullet points for clarity.
    - **Sections and Subsections:** Organize content into sections and subsections to make it easier to follow.
6. **Clarity and Conciseness**
    - **Simple Language:** Use clear and concise language. Avoid jargon and technical terms unless necessary, and provide explanations when used.
    - **Examples and Scenarios:** Include examples and scenarios to illustrate how to perform tasks and troubleshoot issues.
    - **Testing:** Test the instructions with real users to identify any areas of confusion and make necessary revisions.

Detailed methods for writing instructional materials, such as user manuals and guides.

6.8 Using Technology Tools for Technical Writing: Leveraging technology tools can enhance the efficiency and quality of technical writing. Here are some tools to consider:

5. **Writing and Editing Tools**
    - **Microsoft Word:** A versatile word processor with features for writing, formatting, and collaboration.
    - **Google Docs:** A cloud-based word processor that enables real-time collaboration and sharing.
    - **Markdown Editors:** Tools like Typora and Dillinger for writing in Markdown, a lightweight markup language.
6. **Content Management Systems (CMS)**
    - **MadCap Flare:** A powerful CMS designed for technical writers to create and manage documentation.
    - **Adobe FrameMaker:** A professional tool for creating structured documents and long-format content.
    - **Paligo:** A cloud-based CMS for creating, managing, and publishing technical documentation.
7. **Graphics and Visualization Tools**
    - **Adobe Illustrator:** A vector graphics editor for creating detailed diagrams and illustrations.
    - **Snagit:** A screen capture and recording tool for creating annotated screenshots and videos.
    - **Lucidchart:** A web-based tool for creating flowcharts, diagrams, and other visual content.
8. **Collaboration and Project Management Tools**
    - **Trello:** A project management tool that uses boards, lists, and cards to organize tasks and collaborate with team members.
    - **Asana:** A project management tool for tracking tasks, deadlines, and team collaboration.

- **Slack:** A communication tool for real-time messaging and file sharing among team members.

By mastering these techniques and tools, students will be well-prepared to conduct research, design effective documents, write instructional materials, and leverage technology to enhance their technical writing skills.

Introduction to software and tools commonly used in technical writing, such as content management systems, version control systems, and collaborative platforms.

6.9 Editing and Proofreading: Editing and Proofreading

Effective editing and proofreading are essential for ensuring clarity, consistency, and accuracy in technical documents. Here are some techniques to help you polish your work:

4. **Clarity and Consistency**
    - **Read Aloud:** Reading the document aloud can help identify awkward phrasing, unclear passages, and grammatical errors.
    - **Simplify Language:** Use plain language and avoid jargon or technical terms that may confuse the reader. Ensure that explanations are clear and concise.
    - **Consistency:** Maintain consistent terminology, formatting, and style throughout the document. Use a style guide to ensure uniformity.
5. **Editing Techniques**
    - **Content Review:** Focus on the overall structure and organization of the document. Ensure that the content is logically arranged and flows smoothly.
    - **Fact-Checking:** Verify all factual information, data, and references for accuracy. Ensure that technical specifications and details are correct.
    - **Peer Review:** Have colleagues or subject matter experts review the document for additional feedback and insights.
6. **Proofreading Methods**

- **Multiple Passes:** Proofread the document multiple times, focusing on different aspects each time (e.g., grammar, punctuation, spelling).
- **Take Breaks:** Take breaks between editing sessions to approach the document with fresh eyes.
- **Use Tools:** Utilize proofreading tools like Grammarly, Hemingway Editor, and Microsoft Word's built-in spelling and grammar checker.

6.10 Ethics in Technical Writing

Ethical considerations are crucial in technical writing to maintain integrity, transparency, and trust. Here are some key principles:

3. **Accuracy**
    - **Fact-Based Writing:** Ensure that all information presented is accurate, verifiable, and based on reliable sources.
    - **Avoiding Misleading Information:** Do not exaggerate or misrepresent information. Present data and findings honestly and transparently.
4. **Transparency**
    - **Disclosing Sources:** Always cite sources and references for data, quotes, and research. Provide clear attributions to avoid plagiarism.
    - **Open Communication:** Be transparent about any potential conflicts of interest or biases that may affect the content.

Techniques for ensuring clarity and consistency, and methods to effectively edit and proofread technical documents.

6.10 Ethics in Technical Writing

Understanding the ethical implications and responsibilities of being a technical writer, focusing on accuracy, transparency, and avoiding plagiarism.

6.12 Effective Communication in Teams

Strategies for effective collaboration and communication within project teams, including the role of dffective communication is vital for successful collaboration in technical writing teams. Here are some strategies to enhance team communication:

6. **Clear and Open Communication**
    - **Regular Meetings:** Hold regular team meetings to discuss project progress, address concerns, and share updates.
    - **Communication Channels:** Utilize communication tools like email, Slack, or Microsoft Teams to facilitate real-time collaboration.
7. **Active Listening**
    - **Listening Skills:** Practice active listening by paying attention, asking clarifying questions, and acknowledging others' input.
    - **Feedback:** Provide constructive feedback and be open to receiving feedback from team members.
8. **Role Clarity**
    - **Defined Roles:** Clearly define roles and responsibilities within the team to avoid confusion and overlap.
    - **Documentation:** Document roles, tasks, and deadlines to ensure everyone is on the same page.
9. **Collaborative Tools**
    - **Project Management Tools:** Use tools like Trello, Asana, or Jira to track tasks, deadlines, and project milestones.
    - **Document Collaboration:** Utilize collaborative writing tools like Google Docs or Microsoft Word Online to enable real-time editing and comments.
10. **Conflict Resolution**
    - **Addressing Conflicts:** Address conflicts promptly and professionally. Encourage open dialogue to find mutually agreeable solutions.

- **Mediation:** Involve a neutral third party if needed to mediate and resolve conflicts.

By mastering these techniques and strategies, students will be well-prepared to edit and proofread technical documents, uphold ethical standards, and communicate effectively within teams.

If you need more details or have specific questions on any of these topics, feel free to let me know!

7topics :

7.1.Masters in Vertical Farming and Urban Agriculture with Focus on Synthetic Biology

This course explores the intersection of vertical farming, urban agriculture, and synthetic biology, preparing students to innovate in sustainable food production. Students will gain theoretical knowledge and practical skills to design and implement urban farming systems that leverage synthetic biology for enhanced productivity and sustainability.

7.2Introduction to Vertical Farming and Urban Agriculture

An overview of vertical farming and urban agriculture, their roles in modern food production, and how they contribute to sustainability.: n overview of vertical farming and urban agriculture, their roles in modern food production, and how they contribute to sustainability.

Key Topics:

- **Definitions and Concepts:** Understanding what vertical farming and urban agriculture entail.
- **Historical Development:** Tracing the evolution of these farming techniques.
- **Sustainability Contributions:** How these methods reduce the carbon footprint and promote resource efficiency.

7.3.Fundamentals of Synthetic Biology

Study the basic principles of synthetic biology, including DNA sequencing, genetic engineering, and how these tools are used to optimize plant growth.: Fundamentals of Synthetic Biology

Study the basic principles of synthetic biology, including DNA sequencing, genetic engineering, and how these tools are used to optimize plant growth.

Key Topics:

- **Introduction to Synthetic Biology:** Basic concepts and terminology.
- **DNA Sequencing and Genetic Engineering:** Techniques and applications.
- **Plant Optimization:** How synthetic biology enhances plant growth and resilience

7.4..Applications of Synthetic Biology in Urban Agriculture

Explore how synthetic biology is revolutionizing urban farming, including genetically modified organisms and engineered biosystems that improve crop yield.:

7.6Design of Vertical Farming Systems

Learn the architectural and systems design principles for creating efficient vertical farms in urban environments.: Explore how synthetic biology is revolutionizing urban farming, including genetically modified organisms (GMOs) and engineered biosystems that improve crop yield.

Key Topics:

- **GMOs in Urban Farming:** Benefits and challenges.
- **Engineered Biosystems:** Innovations that enhance productivity and sustainability.
- **Case Studies:** Examples of successful applications in urban agriculture.

7.7Integration of Biotechnology in Crop Production

Discuss the integration of biotechnology tools to enhance crop resilience, nutrient uptake, and pest resistance.: Explore the potential future advancements in vertical farming and synthetic biology.

Key Topics:

- **Innovative Technologies:** Emerging tools and techniques.
- **Sustainability Goals:** Advancing towards more sustainable and resilient food systems.
- **Research and Development:** Ongoing projects and future research directions.

These courses will provide students with a comprehensive understanding of the intersection between vertical farming, urban agriculture, and synthetic biology, equipping them to innovate and lead in the field of sustainable food production.

Feel free to ask if you need more details or specific information on any of these topics!

7.8.Environmental and Economic Impacts of Urban Agriculture

Evaluate the environmental and economic benefits and challenges posed by urban agriculture and vertical farming.

7.9.Regulatory and Ethical Considerations in Synthetic Biology

Examine the regulatory frameworks and ethical considerations associated with the use of synthetic biology in agriculture.: Regulatory frameworks for synthetic biology vary globallyRegulatory frameworks for synthetic biology vary globally

7.10Future Trends in Vertical Farming and Synthetic Biology

Explore the potential future advancements in vertical farming technologies and synthetic biology app **Equity and Access**: Ensuring fair access to the benefits of synthetic biology

8..topic

8.Master's in Urban Water Supply, Sewerage, Waste Management, and Remediation Activities

8.1. This course delves into the complexities of urban infrastructure related to water supply, sewerage, waste management, and remediation activities. Students will explore the technical, environmental, and policy-related aspects of effective urban planning necessary to manage these essential services sustainably. The course equips graduates with the skills to address challenges related to population growth, urbanization, and climate change in water and waste sectors.

8.2.Introduction to Urban Water Supply Systems

Explore the components of urban water supply systems, including water sourcing, treatment, distribution, and quality management. Understand the challenges and technological advancements in managing urban water supply.:

Explore the components of urban water supply systems, including water sourcing, treatment, distribution, and quality management. Understand the challenges and technological advancements in managing urban water supply.

Key Topics:

- **Water Sourcing:** Identifying and managing sources of water such as rivers, lakes, and groundwater.
- **Water Treatment:** Processes for purifying water to meet safety and quality standards.
- **Distribution Systems:** Designing and maintaining networks for efficient water delivery.
- **Quality Management:** Monitoring and ensuring the quality of water supplied to urban areas.

8.3 Sewerage Systems Design and Manage

8.3.Sewerage Systems Design and Management

Learn about the engineering, design, and operational management of urban sewerage systems, focusing on sustainable practices and innovations in waste treatment and resource recovery.: Sewerage Systems Design and Management

Learn about the engineering, design, and operational management of urban sewerage systems, focusing on sustainable practices and innovations in waste treatment and resource recovery.

Key Topics:

- **Engineering Principles:** Understanding the fundamentals of sewerage system design.
- **Sustainable Practices:** Implementing environmentally friendly waste treatment methods.
- **Resource Recovery:** Techniques for reclaiming and repurposing resources from was

8.4.Urban Waste Management Strategies

Understand the principles and methods of waste management in urban areas, addressing : Understand the principles and methods of waste management in urban areas, addressing the complexities and challenges of managing solid and liquid waste effectively.

Key Topics:

- **Waste Collection and Disposal:** Strategies for efficient waste collection, segregation, and disposal.
- **Recycling and Reuse:** Promoting recycling and reuse to minimize waste generation.
- **Waste Reduction:** Implementing programs and policies to reduce overall waste output.

8.5.Remediation Activities and Technologies

Explore different technologies and methodologies used in the remediation of contaminated sites, focusing on both chemical and biological methods. Learn how to effectively integrate water supply, sewerage, and waste management into urban planning processes to create more sustainable and livable cities.

Key Topics:

- **Urban Planning Principles:** Incorporating water and waste considerations into urban design.
- **Interdisciplinary Approaches:** Collaborating with various stakeholders for holistic planning.
- **Sustainable Development Goals:** Aligning urban planning with global sustainability objectives.

These courses provide a comprehensive understanding of urban water supply, sewerage, waste management, and remediation activities, preparing students to tackle the challenges of modern urban infrastructure.

If you need more details or have specific questions on any of these topics, feel free to let me know!

8.6.Policy and Regulation in Urban Water and Waste

Gain insights into the regulatory frameworks and policies that govern urban water and waste management. Explore how legislation impacts planning and operational practices. Learn how to effectively integrate water supply, sewerage, and waste management into urban planning processes to create more sustainable and livable cities.

Key Topics:

- **Urban Planning Principles:** Incorporating water and waste considerations into urban design.
- **Interdisciplinary Approaches:** Collaborating with various stakeholders for holistic planning.
- **Sustainable Development Goals:** Aligning urban planning with global sustainability objectives.

These courses provide a comprehensive understanding of urban water supply, sewerage, waste management, and remediation activities, preparing students to tackle the challenges of modern urban infrastructure.

If you need more details or have specific questions on any of these topics, feel free to let me know!

8.7.Climate Change and its Impact on Water and Waste Management

Examine how climate change affects urban water and waste systems and explore adaptive strategies to enhance resilience and sustainability.

8.8..Sustainable Innovations in Water and Waste Systems

Discover emerging technologies and innovative practices for enhancing sustainability in urban water and waste management systems.: The pursuit of sustainability in urban water and waste management systems involves adopting emerging technologies and innovative practices. Here are some cutting-edge innovations:

Emerging Technologies:

3. **Smart Water Management Systems**
    - Utilize IoT sensors and real-time data analytics to monitor water quality, detect leaks, and optimize water usage.
    - Implement smart meters to provide accurate water consumption data and encourage conservation.
4. **Advanced Water Treatment Technologies**
    - Adopt membrane filtration, advanced oxidation processes, and nanotechnology to enhance water purification and recycling.
4. Use desalination technologies to convert seawater into **aste-to-Energy Technologies**
    - Convert organic waste into biogas through anaerobic digestion, reducing landfill waste and generating renewable energy.
    - Implement gasification and pyrolysis to transform solid waste into syngas and biochar.

5. **Decentralized Wastewater Treatment**
    - Develop decentralized systems that treat wastewater close to the source, reducing the need for extensive sewer networks and lowering energy consumption.
    - Use constructed wetlands and natural treatment systems for cost-effective and sustainable wastewater management.
6. **Green Infrastructure**
    - Integrate green roofs, permeable pavements, and rain gardens to manage stormwater and reduce urban heat islands.
    - Employ urban wetlands and bioswales to enhance natural water filtration and storage.

Innovative Practices:

-

7. 8.9Integrating Water and Waste Systems into Urban Planning**Holistic Planning Approaches**
    - Adopt integrated planning frameworks that consider water and waste systems as interconnected components of urban infrastructure.
    - Use spatial planning tools to optimize the placement of water and waste facilities, minimizing environmental impact and maximizing efficiency.
8. **Sustainable Development Goals (SDGs)**
    - Align urban planning efforts with the United Nations Sustainable Development Goals, particularly SDG 6 (Clean Water and Sanitation) and SDG 11 (Sustainable Cities and Communities).
    - Promote sustainable land use practices that protect water resources and reduce waste generation.
9. **Interdisciplinary Collaboration**

- Foster collaboration among urban planners, engineers, environmental scientists, and policymakers to develop comprehensive solutions.
- Engage stakeholders, including local communities, businesses, and NGOs, in the planning process to ensure diverse perspectives and needs are addressed.

10. **Climate Resilience and Adaptation**

- Incorporate climate resilience measures into urban planning to address the impacts of climate change on water and waste systems.
- Develop adaptive strategies to manage extreme weather events, such as floods and droughts, and ensure the continuity of essential services.

11. **Green and Blue Infrastructure Integration**

- Integrate green infrastructure (e.g., parks, green roofs) and blue infrastructure (e.g., rivers, lakes) into urban landscapes to enhance ecosystem services and improve water management.
- Design urban spaces that promote natural water infiltration, reduce runoff, and support biodiversity.

12. **Data-Driven Decision Making**

- Utilize Geographic Information Systems (GIS), remote sensing, and data analytics to inform planning decisions and monitor system performance.
- Implement smart city technologies to enhance the management and operation of water and waste systems.

By adopting these strategies and embracing innovative technologies, urban planners can create more sustainable, resilient, and livable cities that effectively manage water and waste systems.

If you have any specific questions or need more detailed information on any of these topics, feel free to ask!

Learn how to effectively integrate water supply, sewerage, and waste management into urban planning processes to create more sustainable and livable cities.

9.topic

9.1.Transportation and Warehousing in Tourism Planning and Development

This course offers a comprehensive study into how transportation and warehousing play a crucial role in tourism planning and development. Students will explore the logistics, infrastructure, and management strategies required to optimize tourism supply chains, improve accessibility, and enhance the overall tourist experience. This course provides insights into transportation modes, warehousing solutions, and policy frameworks essential for sustainable tourism development.

9.2..Introduction to Tourism Logistics

Explores the fundamental principles of logistics management within the tourism sector, emphasizing its role in seamless travel experiences. **ransportation Modes**

- **Air Travel:** Managing airport logistics, flight scheduling, and passenger services.
- **Rail and Road Transport:** Coordinating bus and rail services for tourists, ensuring efficient transit systems.
- **Maritime Travel:** Organizing ferry and cruise services, port management.

 Warehousing Solutions

- **Storage Facilities:** Designing and managing warehouses for tourism-related goods.
- **Inventory Management:** Techniques for maintaining op

9.3...Transportation Infrastructure in Tourism

Examines the various transportation infrastructures such as airports, seaports, and road networks that support the tourism industry. **Policy Frameworks**

- **Regulatory Compliance:** Understanding laws and regulations affecting transportation and warehousing in tourism.
- **Sustainability Policies:** Implementing eco-friendly practices to minimize environmental impact.

9.4..Role of Warehousing in Tourism

Discusses how warehousing and inventory management contribute to the efficiency of tourism operations. **ogistics and Infrastructure**

- **Supply Chain Management:** Strategies for efficient coordination of suppliers, transporters, and retailers.
- **Infrastructure Development:** Planning and constructing facilities to support tourism activities.
- **Technology Integration:** Using digital tools for tracking, scheduling, and management.

9.5..Sustainable Transport Solutions

Covers sustainable practices and innovations in transportation that minimize environmental impact and promote eco-friendly tourism. **Accessibility Improvement**

- **Barrier-Free Travel:** Designing inclusive transportation systems for travelers with disabilities.
- **Connectivity Enhancement:** Ensuring seamless transitions between different modes of transport.

9.6..Tourism Supply Chain Management

Analyzes the intricacies of supply chain management specifically in the tourism sector, including challenges and best practices. **Logistics Management Fundamentals**

- **Definition and Scope:** Understanding what tourism logistics encompasses.
- **Key Components:** Identifying the main elements of tourism logistics, such as transportation, warehousing, and inventory management.

 Role in Seamless Travel Experiences

- **Customer Satisfaction:** Ensuring tourists have smooth and enjoyable experiences from arrival to departure.
- **Efficiency and Reliability:** Improving the efficiency and reliability of travel services through effective logistics.

9.7.Policy and Regulations in Tourism Transport

Explores the regulations and policies affecting transportation and warehousing, and how they influence tourism development. **ogistics Challenges in Tourism**

- **Seasonal Demand:** Managing fluctuations in demand due to tourist seasons.
- **Coordination Complexity:** Overcoming challenges in coordinating multiple service providers and stakeholders.

 Technological Advancements

- **Digital Solutions:** Utilizing technology to streamline logistics processes, such as online booking systems and real-time tracking.
- **Data Analytics:** Leveraging data to predict trends, optimize routes, and improve service delivery.

9.8.Innovations in Tourism Warehousing

Investigates recent technological advancements in warehousing that support tourism industry needs. 9.8 Innovations in Tourism Warehousing

This section investigates recent technological advancements in warehousing that support the tourism industry's needs. Some notable innovations include:

Technological Advancements:

2. **Smart Warehousing:** Automation and AI-driven inventory management systems optimize workflows and reduce human error

9.9..Case Studies on Tourism and Logistics

Presents case studies highlighting logistics success and challenges in various tourism destinations. his section presents case studies highlighting logistics success and challenges in various tourism destinations. Some examples include:

Case Studies:

2. **Public Policy Co-Creation in Recife:** Examines the creative tourism plan development process in Recife, Brazil

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10.topics

10.1..Spatial Computing in Telecommunications

This course explores the integration of spatial computing technologies within the telecommunications sector. Students will gain an understanding of how spatial data is utilized to enhance network efficiencies, improve service delivery, and innovate telecommunications solutions. Covering foundational concepts to advanced applications, the course is designed for those aiming to lead in the evolution of telecom networks through spatial computing innovations.

10.2..Introduction to Spatial Computing

This topic covers the basics of spatial computing, its historical evolution, and its current importance across various industries, with a particular focus on telecommunications. Key Topics:

3. **Foundational Concepts**
    - **Spatial Data:** Understanding the types of spatial data, including geographic information systems (GIS), location-based services (LBS), and remote sensing.
    - **Spatial Computing Principles:** Basic principles of spatial computing, including spatial analysis, data visualization, and geospatial intelligence.
4. **Network Efficiencies**
    - **Optimizing Network Design:** Utilizing spatial data to design more efficient and reliable telecommunications networks.

10.3..Spatial Data and Telecommunications

- An exploration of the types and sources of spatial data utilized in telecommunications, as well as methods for data collection and management.

  Resource Allocation: Applying spatial analysis to optimize the allocation of network resources and infrastructure placement.

 Service Delivery Improvements

- **Location-Based Services:** Enhancing service delivery through the integration of location-based services and personalized user experiences.
- **Coverage Mapping:** Using spatial data to identify coverage gaps and optimize network coverage.

10.4..Geographical Information Systems (GIS) in Telecom

This topic discusses the application of GIS technologies for network planning, resource optimization, and service provisioning in telecommunications. **nnovative Solutions**

- **Smart Cities:** Leveraging spatial computing to develop smart city solutions that integrate telecommunications with urban infrastructure.

- **Augmented Reality (AR) and Virtual Reality (VR):** Exploring the applications of AR and VR in telecommunications, such as immersive communication experiences and virtual site inspections.

10.5..Network Planning and Optimization Using Spatial Computing

Strategies for using spatial computing to optimize telecom network deployments and enhancements through simulation and analytic tools.

10.6.Spatial Data Analytics for Telecom

An examination of analytic techniques and algorithms that leverage spatial data to provide insights and performance improvements in telecom services.
Advanced Applications

- **5G and Beyond:** Investigating the role of spatial computing in the deployment and optimization of 5G networks and future technologies.

- **Predictive Analytics:** Using spatial data for predictive analytics to anticipate network demands and prevent service disruption

10.7..Augmented Reality (AR) in Telecommunication Services

Understanding the role of AR technologies in enhancing customer experiences and operational efficiencies within telecom services. This topic covers the basics of spatial computing, its historical evolution, and its current importance across various industries, with a particular focus on telecommunications.

Key Topics:

3. **Basics of Spatial Computing**
    - **Definition and Scope:** Understanding what spatial computing entails and its applications.

- **Key Components:** Identifying the main elements of spatial computing, such as spatial data, geospatial analysis, and visualization.

4. **Historical Evolution**

    - **Early Developments:** Tracing the origins of spatial computing from early cartography and geographic information systems (GIS).

    - **Technological Advancements:** Highlighting key technological advancements that have shaped the field, such as remote sensing and GPS technol

10.11..5G and Spatial Computing

2. Investigating how 5G technology benefits from spatial computing, including precise location services and improved connectivity solutions. **urrent Importance**

    - **Cross-Industry Applications:** Exploring how spatial computing is used in various industries, including transportation, healthcare, retail, and agriculture.

    - **Focus on Telecommunications:** Examining the specific applications of spatial computing in telecommunications, such as network planning, coverage optimization, and location-based services.

These courses provide students with a comprehensive understanding of spatial computing and its transformative impact on telecommunications, preparing them to lead in the innovation and optimization of telecom networks.

If you have any specific questions or need more details on a

10.12..Privacy and Security in Spatial Telecommunications

A look into the potential security and privacy challenges posed by spatial data in telecommunications and strate,

Key Challenges:

2. **Data Privacy Concerns**: The extensive collection and transmission of spatial data can lead to unauthorized access and potential privacy breaches

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11..topics

11.1..Advanced Legal Studies in Public Administration and Safety

This course is designed for Master's level students pursuing a degree in Public Administration and Safety with a focus on Legal Studies. It aims to provide students with a comprehensive understanding of the legal frameworks and principles that underpin public administration and safety mechanisms. The course covers a range of topics, from constitutional law and administrative law to policy-making and legal ethics, equipping students with the skills needed to navigate the complex legal landscape within the public sector.

11.2Introduction to Public Law

An overview of the principles and functions of public law, including constitutional and administrative law, which regulate the relationship between individuals and the state.

An overview of the principles and functions of public law, including constitutional and administrative law, which regulate the relationship between individuals and the state.

Key Topics:

- **Principles of Public Law:** Understanding the foundational concepts of public law.
- **Constitutional Law:** Examining the structure and functions of the constitution in regulating state authority.
- **Administrative Law:** Exploring the rules that govern the actions of administrative agencies.

11.3.Constitutional Law and Governance

Exploration of constitutional principles and how they guide governance and the formation of public policies. Exploration of constitutional principles and how they guide governance and the formation of public policies.

Key Topics:

- **Constitutional Principles:** Understanding fundamental principles like the rule of law, separation of powers, and checks and balances.
- **Governance:** Analyzing how constitutional principles influence the design and functioning of government institutions.
- **Public Policy Formation:** Examining the role of constitutional law in shaping public policies.

11.4.Administrative Law

Understanding the rules and regulations that govern the activities of administrative agencies of government. Understanding the rules and regulations that govern the activities of administrative agencies of government.

Key Topics:

- **Administrative Agencies:** Exploring the creation, powers, and functions of administrative agencies.
- **Regulatory Frameworks:** Understanding the legal frameworks that regulate administrative actions.
- **Judicial Review:** Examining the mechanisms for reviewing administrative decisions

11.5.Legal Frameworks for Public Safety

Examination of the legal structures and policies designed to protect public safety and maintain order.

11.6..Ethics in Public Administration

Study of ethical principles and how they apply to decision-making processes in public administration. Examination of the legal structures and policies designed to protect public safety and maintain order.

Key Topics:

- **Public Safety Laws:** Analyzing laws and regulations aimed at protecting public safety.
- **Policy Development:** Understanding the process of developing and implementing public safety policies.
- **Enforcement Mechanisms:** Exploring the role of law enforcement agencies in maintaining public order.

11.7..Public Policy and Legal Implications

Analysis of the intersection of law and public policy and the impact of legal frameworks on policy formation. Study of ethical principles and how they apply to decision-making processes in public administration.

Key Topics:

- **Ethical Theories:** Understanding various ethical theories and their application in public administration.
- **Decision-Making:** Examining ethical considerations in decision-making processes.
- **Accountability:** Exploring mechanisms for ensuring ethical conduct and accountability in public administration.

Analysis of the intersection of law and public policy and the impact of legal frameworks on policy formation.

Key Topics:

- **Law and Policy:** Understanding the relationship between legal frameworks and public policy.
- **Policy Analysis:** Examining the legal implications of policy decisions.
- **Case Studies:** Analyzing real-world examples of law influencing public policy

11.8..Human Rights and Social Justice

Understanding the role of law in promoting human rights and social justice in public administration. Understanding the role of law in promoting human rights and social justice in public administration.

Key Topics:

- **Human Rights Law:** Exploring international and domestic human rights frameworks.
- **Social Justice:** Examining the role of law in addressing social inequalities and promoting justice.
- **Advocacy:** Understanding the

11.9.Crisis Management and Legal Compliance

Strategies for managing crises in public administration while ensuring compliance with legal standards. Strategies for managing crises in public administration, ensuring legal compliance, and maintaining order.

Key Topics:

- **Crisis Management:** Developing strategies for effectively managing crises in public administration.
- **Legal Compliance:** Ensuring adherence to legal frameworks during crisis situations.
- **Contingency Planning:** Creating plans for maintaining public safety and order during emergencies.

These courses provide students with a comprehensive understanding of the legal aspects of public administration and safety, preparing them to navigate the complex legal landscape in the public sector.

If you have any specific questions or need more details on any of these topics, feel free t

12.topic

12.1Metallurgy in Oil and Gas Production, Refining, and Transport

This course provides an in-depth understanding of the metallurgical principles and practices specific to the oil and gas industry. Students will explore the selection, processing, and performance of metals used in various segments of the industry, focusing on their application in production, refining, and transport operations. The course aims to develop a comprehensive knowledge of material selection and corrosion prevention in harsh oil and gas environments.

12.2..Introduction to Metallurgy in Oil and Gas

An overview of the role of metallurgy in the oil and gas industry, discussing the importance of material selection and analyzing common metallurgical challenges faced.

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12.3..Material Selection for Oil and Gas Production

Examines criteria for selecting materials, focusing on mechanical properties and corrosion resistance required in production environments.

An overview of the role of metallurgy in the oil and gas industry, discussing the importance of material selection and analyzing common metallurgical challenges faced.

Key Topics:

- **Role of Metallurgy:** Understanding the critical importance of metallurgy in oil and gas operations.
- **Material Selection:** Factors influencing the selection of materials for different segments of the industry.
- **Common Challenges:** Identifying and addressing common metallurgical issues, such as corrosion and material degradation.

12.4..Corrosion Mechanisms and Prevention

Explores common corrosion mechanisms in oil and gas environments, such as sulfide stress cracking and chloride stress corrosion, and presents methods for their prevention. Examines criteria for selecting materials, focusing on mechanical properties and corrosion resistance required in production environments.

Key Topics:

- **Mechanical Properties:** Evaluating the strength, toughness, and durability of materials.
- **Corrosion Resistance:** Understanding the importance of corrosion resistance in harsh environments.
- **Material Criteria:** Criteria for selecting suitable materials for production equipment and infrastructure.

12.5..Metallurgical Processes in Refining

Discusses how metallurgical processes like heat treatment and welding are utilized in refining operations to enhance material properties. Corrosion Mechanisms and Prevention

Explores common corrosion mechanisms in oil and gas environments, such as sulfide stress cracking and chloride stress corrosion, and presents methods for their prevention.

Key Topics:

- **Corrosion Mechanisms:** Understanding different types of corrosion and their causes.
- **Sulfide Stress Cracking:** Examining how sulfide stress cracking occurs and how to prevent it.
- **Chloride Stress Corrosion:** Exploring the effects of chloride stress corrosion and prevention methods.

12.6..Pipeline Materials and Design

Addresses the materials and design considerations for constructing oil and gas pipelines, including the assessment of failure modes and maintenance practices. iscusses how metallurgical processes like heat treatment and welding are utilized in refining operations to enhance material properties.

Key Topics:

- **Heat Treatment:** Techniques for enhancing the mechanical properties of metals through heat treatment.
- **Welding:** Best practices for welding in refining operations.
- **Material Enhancement:** Methods for improving the performance and longevity of materials used in refining.

12.7.Advanced Coatings and Surface Treatments

Focuses on the application of advanced coatings and surface treatments to protect metals used in oil and gas industry environments. Addresses the materials and design considerations for constructing oil and gas pipelines, including the assessment of failure modes and maintenance practices.

Key Topics:

- **Material Selection for Pipelines:** Criteria for selecting materials for pipeline construction.
- **Pipeline Design:** Principles of pipeline design to ensure safety and reliability.
- **Failure Modes:** Identifying common failure modes and strategies for prevention.
- **Maintenance Practices:** Best practices for maintaining pipeline integrity

Advanced Coatings and Surface Treatments

Focuses on the application of advanced coatings and surface treatments to protect metals used in oil and gas industry environments.

Key Topics:

- **Coating Technologies:** Exploring different types of coatings and their applications.
- **Surface Treatments:** Techniques for treating metal surfaces to enhance durability and resistance to corrosion.
- **Protective Measures:** Implementing protective measures to extend the lifespan of equipment.

12.8.Environmental Impact and Sustainability in Metallurgy

Evaluates the environmental impact of metallurgical practices in the oil and gas industry and explores sustainable practices and innovations. Evaluates the environmental impact of metallurgical practices in the oil and gas industry and explores sustainable practices and innovations.

Key Topics:

- **Environmental Impact:** Assessing the environmental consequences of metallurgical activities.
- **Sustainable Practices:** Implementing eco-friendly practices in metallurgy.
- **Innovations:** Exploring technological innovations for reducing environmental imp

12.9..Failure Analysis and Case Studies

Explores methods for conducting failure analysis on metallurgical components and reviews real-world case studies. Evaluates the environmental impact of metallurgical practices in the oil and gas industry and explores sustainable practices and innovations.

Key Topics:

- **Environmental Impact:** Assessing the environmental consequences of metallurgical activities.
- **Sustainable Practices:** Implementing eco-friendly practices in metallurgy.

- **Innovations:** Exploring technological innovations for reducing environmental imp

Explores methods for conducting failure analysis on metallurgical components and reviews real-world case studies.

Key Topics:

- **Failure Analysis Techniques:** Methods for analyzing and diagnosing material failures.
- **Case Studies:** Reviewing real-world examples of metallurgical failures and the lessons learned.
- **Preventive Measures:** Developing strategies to prevent future failur

12.10Future Trends in Metallurgy for Oil and Gas

Discusses emerging trends and technological advancements in metallurgy that could shape the future of the oil and gas industry. Discusses emerging trends and technological advancements in metallurgy that could shape the future of the oil and gas industry.

Key Topics:

- **Emerging Technologies:** Exploring new technologies and their potential impact on metallurgy.
- **Industry Trends:** Identifying trends that are likely to influence the future of metallurgy in the oil and gas sector.
- **Research and Development:** Current and future research initiatives aimed at advancing metallurgical practices.

These courses provide a comprehensive understanding of metallurgical principles and practices tailored to the oil and gas industry, equipping students with the knowledge and skills necessary to address the unique challenges of this field.

If you need more details or specific information on any of these topics, feel fr

13.Topics:

13.1.Integrated Water Management in Mining

This course provides an in-depth analysis of integrated water management practices within the mining industry. It covers sustainable management and conservation of water resources, focusing on balancing economic, environmental, and societal needs. The course examines technological advances, regulatory frameworks, and case studies, aimed at equipping students with the knowledge and skills necessary for effective water management in mining operations.

13.2.Introduction to Mining Water Management

Overview of water use in mining operations, including extraction, processing, and remediation. Discusses the significance of integrated water management and its role in sustainable mining.

13.2.Water Resource Evaluation and Planning

Methods for evaluating water resources at mining sites, including hydrological assessments and water balance studies. Covers planning frameworks for sustainable water management.

13.3.Water Quality Management in Mining

Techniques for monitoring and managing water quality in mining contexts, including treatment technologies and pollution control measures.

13.4.Regulatory and Environmental Compliance

An overview of legal frameworks and environmental regulations affecting water use in mining. Discusses compliance strategies and reporting requirements.

13.5.Innovation and Technology in Water Management

Examination of advanced technologies and innovative approaches in water management, such as desalination, water recycling, and smart water systems.

13.6.Stakeholder Engagement and Social License

The importance of engaging with stakeholders and communities regarding water management in mining. Covers strategies for maintaining a social license to operate.

13.7..Climate Change Impacts on Water Resources

Analyzes the effects of climate change on water availability and management in mining operations. Discusses adaptation strategies for minimizing risks.

13.8.Case Studies and Best Practices

Review of real-world examples of successful water management in mining operations. Discusses lessons learned and best practices in the industry.

13.7.Future Trends in Mining Water Management

Explores anticipated future developments in water management technologies and policies in mining.

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13.2 Introduction to Mining Water Management

Overview of water use in mining operations, including extraction, processing, and remediation. Discusses the significance of integrated water management and its role in sustainable mining.

Key Topics:

- **Water Use in Mining:** Understanding the various stages of water use in mining operations, from extraction to processing and remediation.
- **Integrated Water Management:** The importance of a holistic approach to managing water resources sustainably.

- **Significance in Sustainable Mining:** How integrated water management contributes to sustainable mining practices.

13.3 Water Resource Evaluation and Planning

Methods for evaluating water resources at mining sites, including hydrological assessments and water balance studies. Covers planning frameworks for sustainable water management.

Key Topics:

- **Hydrological Assessments:** Techniques for assessing the availability and quality of water resources at mining sites.
- **Water Balance Studies:** Understanding the inputs and outputs of water within mining operations.
- **Planning Frameworks:** Developing comprehensive plans for sustainable water management.

13.4 Water Quality Management in Mining

Techniques for monitoring and managing water quality in mining contexts, including treatment technologies and pollution control measures.

Key Topics:

- **Water Quality Monitoring:** Methods for regularly assessing water quality.
- **Treatment Technologies:** Exploring technologies for treating contaminated water in mining operations.
- **Pollution Control:** Strategies for preventing and controlling pollution in mining environments.

13.5 Regulatory and Environmental Compliance

An overview of legal frameworks and environmental regulations affecting water use in mining. Discusses compliance strategies and reporting requirements.

Key Topics:

- **Legal Frameworks:** Understanding the regulations governing water use in mining.
- **Environmental Compliance:** Ensuring mining operations adhere to environmental standards.
- **Reporting Requirements:** Developing strategies for meeting regulatory reporting obligations.

13.6 Innovation and Technology in Water Management

Examination of advanced technologies and innovative approaches in water management, such as desalination, water recycling, and smart water systems.

Key Topics:

- **Desalination:** Using desalination technology to provide fresh water for mining operations.
- **Water Recycling:** Implementing recycling systems to reduce water consumption.
- **Smart Water Systems:** Leveraging digital technologies to optimize water management.

13.7 Stakeholder Engagement and Social License

The importance of engaging with stakeholders and communities regarding water management in mining. Covers strategies for maintaining a social license to operate.

Key Topics:

- **Stakeholder Engagement:** Techniques for effectively engaging with stakeholders.
- **Community Involvement:** Involving local communities in water management decisions.
- **Social License to Operate:** Building and maintaining trust with stakeholders.

13.8 Climate Change Impacts on Water Resources

Analyzes the effects of climate change on water availability and management in mining operations. Discusses adaptation strategies for minimizing risks.

Key Topics:

- **Climate Change Effects:** Understanding how climate change impacts water resources in mining.
- **Adaptation Strategies:** Developing strategies to adapt to changing water availability.
- **Risk Minimization:** Implementing measures to minimize risks associated with climate change.

13.9 Case Studies and Best Practices

Review of real-world examples of successful water management in mining operations. Discusses lessons learned and best practices in the industry.

Key Topics:

- **Successful Case Studies:** Examining examples of effective water management in mining.
- **Lessons Learned:** Identifying key takeaways from real-world cases.
- **Best Practices:** Establishing best practices for water management in mining.

13.10 Future Trends in Mining Water Management

Explores anticipated future developments in water management technologies and policies in mining.

Key Topics:

- **Emerging Technologies:** Investigating new technologies for water management.
- **Policy Developments:** Understanding how policies may evolve to support sustainable water management.
- **Future Directions:** Exploring potential future trends in water management for mining.

These courses provide a comprehensive understanding of integrated water management in the mining industry, equipping students with the knowledge and skills necessary for sustainable and effective water management practices.

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15.topics

15.1.Advanced Manufacturing Techniques in Genetic Engineering

This course explores the convergence of manufacturing processes and genetic engineering advancements, focusing on the development, production, and application of genetically engineered products. Students will gain deep insights into techniques used to enhance manufacturing processes in biotechnology and genetic engineering fields.

15.2.Introduction to Genetic Engineering

Provides a foundational understanding of genetic engineering principles, techniques, and its application in various fields including biotechnology.

15.3..Manufacturing Processes in Biotechnology

Covers traditional and innovative manufacturing processes used in biotechnology, essential for producing genetically modified organisms and compounds.

15.4..CRISPR and Advanced Genetic Modification Techniques

An in-depth look at cutting-edge genetic modification techniques such as CRISPR, which are revolutionizing genetic engineering and manufacturing.

15.5.Ethical and Regulatory Considerations

Discusses the ethical dilemmas and regulatory framework governing genetic engineering and manufacturing processes.

15.6.Biopharmaceutical Manufacturing

Explores the manufacturing techniques specific to biopharmaceuticals produced through genetic engineering.

15.7.Fermentation Technology

Focuses on fermentation processes used in manufacturing biologically engineered products.

15.8..Scale-Up and Commercialization

Discusses the challenges and strategies involved in scaling genetic engineering products from laboratory to market.

15.9.Quality Control in Genetically Engineered Products

Examines the quality control methodologies specific to genetic engineering industries.

15.10.Future Trends in Genetic Engineering Manufacturing

Looks ahead at emerging trends and technologies that are poised to influence the genetic engineering and manufacturing landscape.

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16.topics

16.1.Data Processing and Hosting Services in Computer Engineering

This course is designed for graduate students pursuing a Master's degree in Computer Engineering with a focus on data processing and hosting services. It explores the advanced concepts, methodologies, and applications in managing and processing vast amounts of data, and the technological infrastructure in hosting services necessary to support such activities.

16.2.Introduction to Data Processing

An overview of data processing concepts including data collection, cleaning, transformation, and storage.

16.3.Cloud Hosting Services

Understanding cloud hosting fundamentals including types of cloud services, deployment models, and scalability.

16.4..Big Data Technologies

Exploring the tools and technologies used for processing and managing big data such as Hadoop and Spark.

16.5Data Security in Cloud Hosting

An in-depth look into data security practices in cloud hosting environments, including encryption and access management.

16.6.Containerization and Microservices

Understanding containerization technologies like Docker and Kubernetes and their role in hosting services.

16.7Distributed Systems

Study of distributed computing systems architecture, design, and management.

16.8.Data Warehousing and Analytics

Techniques and tools used to design data warehouses and leverage analytics for business intelligence.

16.9..Serverless Computing

Exploration of serverless computing models and their application in data hosting services.

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16.2 Introduction to Data Processing

An overview of data processing concepts including data collection, cleaning, transformation, and storage.

Key Topics:

- **Data Collection:** Methods and tools for gathering data from various sources.
- **Data Cleaning:** Techniques for identifying and correcting errors in data sets.
- **Data Transformation:** Processes for converting data into a usable format.
- **Data Storage:** Solutions for storing large volumes of data efficiently.

16.3 Cloud Hosting Services

Understanding cloud hosting fundamentals including types of cloud services, deployment models, and scalability.

Key Topics:

- **Types of Cloud Services:** Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS).
- **Deployment Models:** Public cloud, private cloud, and hybrid cloud.

- **Scalability:** Techniques for scaling cloud resources to meet demand.

16.4 Big Data Technologies

Exploring the tools and technologies used for processing and managing big data such as Hadoop and Spark.

Key Topics:

- **Hadoop:** Overview of the Hadoop ecosystem and its components.
- **Spark:** Understanding Apache Spark and its use in big data processing.
- **Big Data Frameworks:** Comparing different frameworks and their applications.

16.5 Data Security in Cloud Hosting

An in-depth look into data security practices in cloud hosting environments, including encryption and access management.

Key Topics:

- **Encryption:** Techniques for encrypting data at rest and in transit.
- **Access Management:** Strategies for managing user access and permissions.
- **Security Protocols:** Implementing security protocols to protect data in the cloud.

16.6 Containerization and Microservices

Understanding containerization technologies like Docker and Kubernetes and their role in hosting services.

Key Topics:

- **Docker:** Basics of Docker and containerization.
- **Kubernetes:** Orchestration of containerized applications using Kubernetes.

- **Microservices Architecture:** Designing applications using microservices for scalability and flexibility.

16.7 Distributed Systems

Study of distributed computing systems architecture, design, and management.

Key Topics:

- **Distributed Computing:** Principles and challenges of distributed systems.
- **System Architecture:** Designing and managing distributed system architectures.
- **Consistency and Fault Tolerance:** Ensuring consistency and reliability in distributed environments.

16.8 Data Warehousing and Analytics

Techniques and tools used to design data warehouses and leverage analytics for business intelligence.

Key Topics:

- **Data Warehousing:** Design and implementation of data warehouses.
- **ETL Processes:** Extract, Transform, Load processes for data warehousing.
- **Business Intelligence:** Leveraging analytics for decision-making and insights.

16.9 Serverless Computing

Exploration of serverless computing models and their application in data hosting services.

Key Topics:

- **Serverless Models:** Understanding Function as a Service (FaaS) and Backend as a Service (BaaS).

- **Benefits of Serverless:** Scalability, cost-efficiency, and simplified management.
- **Use Cases:** Real-world applications of serverless computing.

These topics provide a comprehensive understanding of data processing and hosting services in computer engineering, equipping students with the knowledge and skills to manage and process vast amounts of data effectively.

If you have any specific questions or need more details on a

17.topics

17.1.Masters in Cryptocurrency and Blockchain Applications

This course provides an in-depth exploration of blockchain technology and digital currency. Students will learn about the foundational principles of the blockchain, the development and application of cryptocurrencies, and various real-world applications. Emphasis will be placed on developing a practical understanding of blockchain software, digital currency markets, and smart contracts.

17.2.Introduction to Blockchain Technology

Learn the fundamentals of blockchain technology, including its history, key concepts, and how it differs from traditional databases.

17.2.Cryptocurrencies: An Overview

Understand the various types of cryptocurrencies, their functions, and the economics underlying digital currencies.

17.3.Blockchain Consensus Mechanisms

Explore how consensus mechanisms like Proof of Work, Proof of Stake, and others operate within blockchain networks.

17.4..Smart Contracts

Learn about smart contracts, their capabilities, use cases, and limitations. Understand how they are deployed and managed on blockchain networks.

17.5.Decentralized Finance (DeFi)

Explore the growth of DeFi platforms and how they are revolutionizing traditional financial systems.

17.6.Blockchain in Supply Chain Management

Understand how blockchain technology is applied in supply chain management to enhance transparency and efficiency.

17.7.Regulation and Compliance in Blockchain

Study the regulatory landscape surrounding blockchain technology and cryptocurrencies, including the challenges and opportunities involved.

17.8.NFTs and Digital Assets

Explore the world of Non-Fungible Tokens (NFTs), their creation, market dynamics, and how they impact digital ownership and media.

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17.2 Introduction to Blockchain Technology

Learn the fundamentals of blockchain technology, including its history, key concepts, and how it differs from traditional databases.

Key Topics:

- **History of Blockchain:** Tracing the origins and evolution of blockchain technology.

- **Key Concepts:** Understanding blocks, chains, nodes, and consensus mechanisms.
- **Differences from Traditional Databases:** Comparing blockchain to centralized databases in terms of structure, security, and transparency.

17.3 Cryptocurrencies: An Overview

Understand the various types of cryptocurrencies, their functions, and the economics underlying digital currencies.

Key Topics:

- **Types of Cryptocurrencies:** Bitcoin, Ethereum, altcoins, and stablecoins.
- **Functions of Cryptocurrencies:** Medium of exchange, store of value, and investment asset.
- **Economics of Digital Currencies:** Supply, demand, market capitalization, and price volatility.

17.4 Blockchain Consensus Mechanisms

Explore how consensus mechanisms like Proof of Work, Proof of Stake, and others operate within blockchain networks.

Key Topics:

- **Proof of Work (PoW):** Understanding the mining process, energy consumption, and security.
- **Proof of Stake (PoS):** Staking, validators, and energy efficiency.
- **Alternative Consensus Mechanisms:** Delegated Proof of Stake (DPoS), Practical Byzantine Fault Tolerance (PBFT), and more.

17.5 Smart Contracts

Learn about smart contracts, their capabilities, use cases, and limitations. Understand how they are deployed and managed on blockchain networks.

Key Topics:

- **Definition and Functionality:** What smart contracts are and how they work.
- **Use Cases:** Applications in finance, supply chain, real estate, and other industries.
- **Limitations:** Challenges such as scalability, security vulnerabilities, and legal considerations.

17.6 Decentralized Finance (DeFi)

Explore the growth of DeFi platforms and how they are revolutionizing traditional financial systems.

Key Topics:

- **Overview of DeFi:** Understanding the principles and goals of decentralized finance.
- **DeFi Platforms:** Popular platforms like Uniswap, Aave, and Compound.
- **Impact on Traditional Finance:** How DeFi is transforming lending, borrowing, trading, and asset management.

17.7 Blockchain in Supply Chain Management

Understand how blockchain technology is applied in supply chain management to enhance transparency and efficiency.

Key Topics:

- **Transparency and Traceability:** How blockchain improves visibility and tracking in supply chains.
- **Efficiency Improvements:** Reducing fraud, errors, and delays in supply chain processes.
- **Case Studies:** Real-world examples of blockchain applications in supply chain management.

17.8 Regulation and Compliance in Blockchain

Study the regulatory landscape surrounding blockchain technology and cryptocurrencies, including the challenges and opportunities involved.

Key Topics:

- **Regulatory Frameworks:** Understanding the legal regulations governing blockchain and cryptocurrencies.
- **Compliance Requirements:** Ensuring compliance with anti-money laundering (AML) and know your customer (KYC) regulations.
- **Challenges and Opportunities:** Navigating the evolving regulatory environment and its impact on the blockchain industry.

17.9 NFTs and Digital Assets

Explore the world of Non-Fungible Tokens (NFTs), their creation, market dynamics, and how they impact digital ownership and media.

Key Topics:

- **Introduction to NFTs:** Understanding what NFTs are and how they work.
- **Market Dynamics:** Trends, marketplaces, and the economic aspects of NFTs.
- **Impact on Digital Ownership:** How NFTs are changing the landscape of digital art, collectibles, and intellectual property.

These topics provide a comprehensive understanding of cryptocurrency and blockchain applications, equipping students with the knowledge and skills to innovate and lead in this rapidly evolving field.

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18 topic

18.1.Advanced Cybersecurity in Bibliotechnology

This course explores the intersection of cybersecurity and bibliotechnology, focusing on protecting digital library systems, data privacy, and integrity in library networks. Students will learn about cybersecurity principles and practices specifically tailored for bibliotechnology, ensuring the safety and security of digital libraries and bibliographic databases.

18.2.Introduction to Cybersecurity in Bibliotechnology

An overview of the basic principles of cybersecurity and their importance in the domain of bibliotechnology.

18.3Threats and Vulnerabilities in Digital Libraries

Understanding the common cybersecurity threats and vulnerabilities unique to digital

18.4.Data Privacy and Integrity in Bibliotechnology

Exploring techniques to ensure data privacy and maintain data integrity for library users and their digital interactions.

18.5.Implementing Security Policies for Digital Libraries

Developing and applying security policies and frameworks tailored for digital libraries to safeguard information assets.

18.6.Access Control in Library Networks

Examining access control mechanisms to secure user authentication and authorization within library systems.

18.7.Digital Rights Management in Bibliotechnology

Understanding digital rights management and its role in protecting digital content in bibliotechnology.

18.8.Network Security Essentials for Digital Libraries

Learn the essentials of securing library networks, combating network-based threats, and implementing robust network security measures.

18.9.Incident Response and Recovery for Digital Libraries

Strategies for effectively responding to and recovering from cybersecurity incidents within digital library environments.

18..10Emerging Cybersecurity Technologies in Bibliotechnology

Explore the role of emerging technologies like AI and blockchain in enhancing cybersecurity in bibliotechnology.

18.1 Advanced Cybersecurity in Bibliotechnology

This course explores the intersection of cybersecurity and bibliotechnology, focusing on protecting digital library systems, data privacy, and integrity in library networks. Students will learn about cybersecurity principles and practices specifically tailored for bibliotechnology, ensuring the safety and security of digital libraries and bibliographic databases.

18.2 Introduction to Cybersecurity in Bibliotechnology

An overview of the basic principles of cybersecurity and their importance in the domain of bibliotechnology.

Key Topics:

- **Cybersecurity Principles:** Basic concepts of cybersecurity such as confidentiality, integrity, and availability.
- **Importance in Bibliotechnology:** Understanding why cybersecurity is crucial for digital libraries and bibliographic databases.
- **Common Cyber Threats:** Identifying typical cyber threats that can affect bibliotechnological systems.

18.3 Threats and Vulnerabilities in Digital Libraries

Understanding the common cybersecurity threats and vulnerabilities unique to digital libraries.

Key Topics:

- **Threat Landscape:** Overview of threats such as malware, phishing, and ransomware.
- **Vulnerabilities:** Identifying and assessing vulnerabilities specific to digital library systems.
- **Risk Assessment:** Techniques for evaluating and mitigating risks in digital libraries.

18.4 Data Privacy and Integrity in Bibliotechnology

Exploring techniques to ensure data privacy and maintain data integrity for library users and their digital interactions.

Key Topics:

- **Data Privacy Techniques:** Implementing privacy measures such as anonymization and encryption.
- **Data Integrity:** Ensuring that data remains accurate and unaltered through checksums and hashes.
- **User Data Protection:** Protecting sensitive information related to library users.

18.5 Implementing Security Policies for Digital Libraries

Developing and applying security policies and frameworks tailored for digital libraries to safeguard information assets.

Key Topics:

- **Policy Development:** Crafting comprehensive security policies for digital libraries.
- **Frameworks:** Utilizing existing security frameworks like ISO/IEC 27001.
- **Policy Enforcement:** Strategies for enforcing and maintaining security policies.

18.6 Access Control in Library Networks

Examining access control mechanisms to secure user authentication and authorization within library systems.

Key Topics:

- **Authentication Methods:** Techniques such as passwords, biometrics, and multi-factor authentication.
- **Authorization:** Ensuring proper access controls and role-based access within library networks.
- **Access Management Tools:** Using tools and software to manage access controls effectively.

18.7 Digital Rights Management in Bibliotechnology

Understanding digital rights management (DRM) and its role in protecting digital content in bibliotechnology.

Key Topics:

- **DRM Principles:** Basic concepts and purposes of DRM.
- **DRM Technologies:** Tools and technologies used for implementing DRM in digital libraries.
- **Content Protection:** Strategies for protecting digital content from unauthorized access and distribution.

18.8 Network Security Essentials for Digital Libraries

Learn the essentials of securing library networks, combating network-based threats, and implementing robust network security measures.

Key Topics:

- **Network Security Fundamentals:** Understanding firewalls, intrusion detection/prevention systems, and VPNs.
- **Network Threats:** Identifying and mitigating threats such as DDoS attacks and man-in-the-middle attacks.
- **Security Measures:** Best practices for securing network infrastructure in digital libraries.

18.9 Incident Response and Recovery for Digital Libraries

Strategies for effectively responding to and recovering from cybersecurity incidents within digital library environments.

Key Topics:

- **Incident Response Planning:** Developing and implementing incident response plans.
- **Recovery Techniques:** Strategies for recovering data and services after a cybersecurity incident.
- **Post-Incident Analysis:** Conducting root cause analysis and improving security measures.

18.10 Emerging Cybersecurity Technologies in Bibliotechnology

Explore the role of emerging technologies like AI and other advanced tools in enhancing cybersecurity in bibliotechnology.

Key Topics:

- **AI in Cybersecurity:** Utilizing artificial intelligence for threat detection and response.
- **Blockchain Technology:** Applying blockchain for secure and transparent data management.
- **Future Trends:** Exploring future trends and advancements in cybersecurity technologies.

These courses provide a comprehensive understanding of advanced cybersecurity principles and practices in the context of bibliotechnology, preparing students to protect digital libraries and bibliographic databases effectively

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19 topics

19.1.1Edge Computing in Modern Power and Energy Systems

This course provides an in-depth exploration of edge computing technologies and their integration into modern power and energy systems. Students will learn about the principles of edge computing and how it can optimize energy distribution, improve grid reliability, and enhance energy management. The course covers various topics such as distributed computing, real-time data processing, IoT in energy systems, and security challenges.

19.2..Introduction to Edge Computing

An overview of edge computing and its significance in the modern power and energy sectors. It covers the basics of edge nodes, latency reduction, and system efficiency.

19.3.Distributed Computing in Energy Systems

Explores how distributed computing operates in energy systems to enhance performance, reliability, and efficiency.

19.4.IoT Applications in Power Systems

Discusses the role of IoT devices in modern power systems for data collection, analysis, and decision-making.

19.5.Real-time Data Processing

Focuses on techniques for real-time data processing at the edge, including algorithms and architectures suited for energy systems.

19.6Security and Privacy in Edge Computing

Examines the security challenges in edge computing environments and how they impact energy systems, with strategies for mitigation.

19.6.Edge Analytics for Energy Management

Investigates the use of edge analytics for optimizing energy management through predictive analytics and machine learning.

19.7.Energy Efficiency Optimization

Covers strategies for improving energy efficiency through edge computing technologies and smart grids.

19.8.Case Studies on Edge Computing in Energy

Presents real-world case studies to illustrate the deployment and impact of edge computing in energy systems.

19.9.Future Trends in Edge Computing for Energy Systems

Explores future developments and potential advancements in edge computing applicable to power and energy systems.

19.1 Edge Computing in Modern Power and Energy Systems

This course provides an in-depth exploration of edge computing technologies and their integration into modern power and energy systems. Students will learn about the principles of edge computing and how it can optimize energy distribution, improve grid reliability, and enhance energy management. The course covers various topics such as distributed

computing, real-time data processing, IoT in energy systems, and security challenges.

19.2 Introduction to Edge Computing

An overview of edge computing and its significance in the modern power and energy sectors. It covers the basics of edge nodes, latency reduction, and system efficiency.

Key Topics:

- **Edge Nodes:** Understanding the role of edge nodes in data processing.
- **Latency Reduction:** Techniques to reduce latency and improve response times.
- **System Efficiency:** Enhancing overall system efficiency through edge computing.

19.3 Distributed Computing in Energy Systems

Explores how distributed computing operates in energy systems to enhance performance, reliability, and efficiency.

Key Topics:

- **Distributed Computing Principles:** Basics of distributed computing and its application in energy systems.
- **Performance Enhancement:** Improving system performance through distributed computing.
- **Reliability and Efficiency:** Ensuring system reliability and operational efficiency.

19.4 IoT Applications in Power Systems

Discusses the role of IoT devices in modern power systems for data collection, analysis, and decision-making.

Key Topics:

- **IoT Devices:** Types and functions of IoT devices in power systems.

- **Data Collection and Analysis:** Leveraging IoT for real-time data collection and analysis.
- **Decision-Making:** Enhancing decision-making processes using IoT data.

19.5 Real-time Data Processing

Focuses on techniques for real-time data processing at the edge, including algorithms and architectures suited for energy systems.

Key Topics:

- **Real-time Processing Techniques:** Algorithms and architectures for real-time data processing.
- **Edge Processing:** Advantages and challenges of processing data at the edge.
- **Application in Energy Systems:** Implementing real-time data processing in energy management.

19.6 Security and Privacy in Edge Computing

Examines the security challenges in edge computing environments and how they impact energy systems, with strategies for mitigation.

Key Topics:

- **Security Challenges:** Identifying security threats in edge computing environments.
- **Privacy Concerns:** Ensuring data privacy in distributed systems.
- **Mitigation Strategies:** Techniques for mitigating security and privacy risks.

19.7 Edge Analytics for Energy Management

Investigates the use of edge analytics for optimizing energy management through predictive analytics and machine learning.

Key Topics:

- **Edge Analytics:** Understanding edge analytics and its benefits.

- **Predictive Analytics:** Using predictive analytics for proactive energy management.
- **Machine Learning:** Applying machine learning models to enhance energy efficiency.

19.8 Energy Efficiency Optimization

Covers strategies for improving energy efficiency through edge computing technologies and smart grids.

Key Topics:

- **Energy Optimization Techniques:** Methods for optimizing energy use.
- **Smart Grids:** Role of smart grids in energy efficiency.
- **Integration with Edge Computing:** How edge computing enhances energy optimization efforts.

19.9 Case Studies on Edge Computing in Energy

Presents real-world case studies to illustrate the deployment and impact of edge computing in energy systems.

Key Topics:

- **Case Studies:** Examples of successful edge computing implementations.
- **Deployment Challenges:** Overcoming challenges in deploying edge computing solutions.
- **Impact Assessment:** Evaluating the impact of edge computing on energy management.

19.10 Future Trends in Edge Computing for Energy Systems

Explores future developments and potential advancements in edge computing applicable to power and energy systems.

Key Topics:

- **Emerging Technologies:** Future technologies that could shape edge computing.
- **Trends in Energy Systems:** Anticipating trends and advancements in energy management.
- **Research and Development:** Ongoing and future research initiatives in edge computing.

These courses provide a comprehensive understanding of edge computing in modern power and energy systems, equipping students with the knowledge and skills to optimize energy distribution, improve grid reliability, and enhance energy management.

If you have any specific questions or need more details on any of these topics, feel free to ask!

Edge Computing for Modern Power and Energy Systems

This advanced course explores the role and integration of edge computing technologies in modern power and energy systems. The syllabus covers fundamental concepts, applications, and the impact of edge computing in enhancing efficiency, reliability, and sustainability in energy systems. Students will learn through theoretical insights and practical applications, supplemented by interactive resources.

Introduction to Edge Computing

Understanding the basic concepts and architecture of edge computing, its significance in reducing latency and improving real-time processing capabilities in power systems.

Role of Edge Computing in Smart Grids

Exploring how edge computing supports smart grid operations including demand response, grid stability, and energy distribution management.

Edge Computing for Renewable Energy Integration

Analyzing the integration of renewable energy sources into power grids using edge computing to enhance efficiency and sustainability.

Data Management and Security in Edge Computing

Understanding how data is managed and secured in edge computing systems, with a focus on the challenges and solutions in power systems.

Machine Learning Applications on the Edge

Investigating the applications of machine learning in edge devices to predict and optimize energy consumption and distribution.

Case Studies in Edge Computing for Energy Systems

Reviewing real-world case studies to understand the implementation and outcomes of edge computing in energy systems.

Challenges and Future Trends

Discussing the current challenges faced by edge computing in energy systems and predicting future trends and technological advancements.

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20 topics

20.1.Masters in Cyber-Physical Systems and Information Technology

This course provides an in-depth understanding of Cyber-Physical Systems (CPS) within the realm of Information Technology. By exploring the convergence of physical and cyber domains, students will gain insights into the integration, design, and application of CPS in various sectors. Through a combination of theoretical studies and practical assignments, this course aims to equip students with the skills necessary to innovate in this rapidly evolving field.

20.2.Introduction to Cyber-Physical Systems

This topic covers the basics of CPS, including definitions, history, and key concepts that distinguish CPS from traditional IT systems.

20.3.Architecture of CPS

Explore the architecture of CPS, focusing on sensors, actuators, control systems, and the role of internet of things (IoT) in CPS.

20.4Networking and Communication in CPS

Understand the communication protocols and networks that enable interaction between cyber and physical components within CPS.

20.5.CPS Security and Privacy

This topic delves into the security challenges in CPS and discusses methods to ensure data integrity and privacy.

20.6.Machine Learning in CPS

Examine the role of machine learning in optimizing the performance and decision-making processes within CPS.

20.7.Real-Time Systems and CPS

Learn about the real-time requirements of CPS and the design considerations necessary to meet these requirements.

20.8.Simulation and Modeling in CPS

Explore tools and methodologies for simulating and modeling CPS to optimize design and operation.

20.9..Applications and Case Studies of CPS

Analyze various applications of CPS in industries like healthcare, automotive, and smart grids with real-world case studies.

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20.1 Masters in Cyber-Physical Systems and Information Technology

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20.2 Introduction to Cyber-Physical Systems

This topic covers the basics of CPS, including definitions, history, and key concepts that distinguish CPS from traditional IT systems.

Key Topics:

- **Definitions:** Understanding what CPS are and how they operate.
- **History:** Tracing the development and evolution of CPS.
- **Key Concepts:** Exploring the unique attributes of CPS, such as real-time computing and system integration.

20.3 Architecture of CPS

Explore the architecture of CPS, focusing on sensors, actuators, control systems, and the role of the Internet of Things (IoT) in CPS.

Key Topics:

- **Sensors and Actuators:** Understanding their roles and how they interact within CPS.
- **Control Systems:** Examining the mechanisms that manage and control physical processes.
- **IoT Integration:** The role of IoT in enhancing CPS functionality and connectivity.

20.4 Networking and Communication in CPS

Understand the communication protocols and networks that enable interaction between cyber and physical components within CPS.

Key Topics:

- **Communication Protocols:** Exploring various protocols used in CPS for data transmission.
- **Network Architecture:** Designing and managing networks to support CPS operations.
- **Data Exchange:** Ensuring efficient and secure data exchange between components.

20.5 CPS Security and Privacy

This topic delves into the security challenges in CPS and discusses methods to ensure data integrity and privacy.

Key Topics:

- **Security Challenges:** Identifying and addressing vulnerabilities in CPS.
- **Data Integrity:** Techniques for ensuring the accuracy and reliability of data.
- **Privacy Measures:** Protecting sensitive information within CPS environments.

20.6 Machine Learning in CPS

Examine the role of machine learning in optimizing the performance and decision-making processes within CPS.

Key Topics:

- **Machine Learning Algorithms:** Applying algorithms to enhance CPS functionality.
- **Optimization:** Using machine learning for predictive maintenance and performance improvement.
- **Decision-Making:** Enhancing automated decision-making processes in CPS.

20.7 Real-Time Systems and CPS

Learn about the real-time requirements of CPS and the design considerations necessary to meet these requirements.

Key Topics:

- **Real-Time Computing:** Understanding the principles of real-time systems.
- **Design Considerations:** Ensuring CPS can meet strict timing constraints.
- **Application Scenarios:** Real-world examples of real-time CPS applications.

20.8 Simulation and Modeling in CPS

Explore tools and methodologies for simulating and modeling CPS to optimize design and operation.

Key Topics:

- **Simulation Tools:** Overview of tools used for CPS simulation.
- **Modeling Techniques:** Creating accurate models of CPS for analysis and optimization.
- **Design Optimization:** Using simulations to improve CPS design and performance.

20.9 Applications and Case Studies of CPS

Analyze various applications of CPS in industries like healthcare, automotive, and smart grids with real-world case studies.

Key Topics:

- **Industry Applications:** Exploring how CPS are applied in different sectors.
- **Case Studies:** Reviewing successful implementations and their outcomes.
- **Lessons Learned:** Understanding the challenges and solutions in real-world CPS projects.

These courses provide a comprehensive understanding of Cyber-Physical Systems and their integration within Information Technology, equipping students with the skills to innovate and lead in this rapidly evolving field.

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21 topics

21.1.Masters in Distributed-Ledger Technology Applications in Educational Technology

This course explores the integration of distributed ledger technologies (DLT), such as blockchain, into educational technology platforms. Students will learn about DLT concepts, their applications in the management and dissemination of educational content, secure credentialing, and enhancing educational efficiencies. The course equips students with both theoretical

understanding and practical skills to innovate within the educational sector using advanced DLT methodologies.

21.1. Introduction to Distributed Ledger Technology

An overview of distributed ledger technology including blockchain, its history, and basic principles that empower decentralized systems.

21.2.The Need for Distributed Ledger Technology in Education

Examine the challenges in the current educational systems and how DLT can address issues around data security, integrity, and cost-efficiency.

21.3.Blockchain for Secure Credentialing

Explore how blockchain can be used for secure credentialing, providing reliable storage and easy verification of educational credentials.

21.4.Smart Contracts in Educational Transactions

Learn about smart contracts and how they can optimize and automate payment systems, enrollments, and certifications in education.

21.5..DLT-based Learning Management Systems

Investigate the potential of DLT to revolutionize Learning Management Systems (LMS) by enabling decentralized data management and analytics.

Privacy and Data Security in DLT

Understand the privacy considerations and security protocols of DLT systems and how data privacy is enhanced within educational contexts.

21.6.Case Studies of DLT in Education

Review real-world implementations of DLT in education and analyze the outcomes and lessons learned from these case studies.

21.7.Future Trends in DLT and EdTech

Delve into the emerging trends and future directions of DLT applications in educational technology.

21.1 Masters in Distributed-Ledger Technology Applications in Educational Technology

This course explores the integration of distributed ledger technologies (DLT), such as blockchain, into educational technology platforms. Students will learn about DLT concepts, their applications in the management and dissemination of educational content, secure credentialing, and enhancing educational efficiencies. The course equips students with both theoretical understanding and practical skills to innovate within the educational sector using advanced DLT methodologies.

21.2 Introduction to Distributed Ledger Technology

An overview of distributed ledger technology including blockchain, its history, and basic principles that empower decentralized systems.

Key Topics:

- **History of DLT:** Understanding the origins and evolution of distributed ledger technology.
- **Basic Principles:** Exploring the core principles of decentralization, transparency, and immutability.
- **Blockchain Technology:** Introduction to blockchain and how it functions as a distributed ledger.

21.3 The Need for Distributed Ledger Technology in Education

Examine the challenges in the current educational systems and how DLT can address issues around data security, integrity, and cost-efficiency.

Key Topics:

- **Current Challenges:** Identifying problems such as data breaches, fraud, and inefficiencies.
- **DLT Solutions:** How distributed ledger technology can enhance data security, ensure data integrity, and reduce costs.
- **Case Examples:** Real-world scenarios where DLT has been implemented in education.

21.4 Blockchain for Secure Credentialing

Explore how blockchain can be used for secure credentialing, providing reliable storage and easy verification of educational credentials.

Key Topics:

- **Credentialing Issues:** Understanding the issues with traditional credentialing methods.
- **Blockchain Solutions:** How blockchain ensures secure and tamper-proof credentialing.
- **Verification:** The process of verifying educational credentials using blockchain.

21.5 Smart Contracts in Educational Transactions

Learn about smart contracts and how they can optimize and automate payment systems, enrollments, and certifications in education.

Key Topics:

- **Smart Contracts:** Understanding what smart contracts are and how they work.
- **Applications in Education:** Using smart contracts for automating payments, enrollments, and certifications.
- **Benefits and Challenges:** Exploring the advantages and potential challenges of implementing smart contracts in education.

21.6 DLT-based Learning Management Systems

Investigate the potential of DLT to revolutionize Learning Management Systems (LMS) by enabling decentralized data management and analytics.

Key Topics:

- **DLT Integration:** How distributed ledger technology can be integrated into LMS.
- **Decentralized Data Management:** Benefits of decentralized data management for educational institutions.
- **Analytics:** Leveraging DLT for enhanced data analytics and insights.

21.7 Privacy and Data Security in DLT

Understand the privacy considerations and security protocols of DLT systems and how data privacy is enhanced within educational contexts.

Key Topics:

- **Privacy Protocols:** Implementing privacy protocols in DLT systems.
- **Data Security:** Ensuring the security of data stored and managed on distributed ledgers.
- **Educational Contexts:** Specific considerations for enhancing data privacy in educational environments.

21.8 Case Studies of DLT in Education

Review real-world implementations of DLT in education and analyze the outcomes and lessons learned from these case studies.

Key Topics:

- **Case Studies:** Detailed analysis of successful DLT implementations in educational settings.
- **Outcomes:** Understanding the impact of DLT on educational processes.
- **Lessons Learned:** Key takeaways and best practices from real-world examples.

21.9 Future Trends in DLT and EdTech

Delve into the emerging trends and future directions of DLT applications in educational technology.

Key Topics:

- **Emerging Trends:** Identifying new and upcoming trends in DLT and EdTech.
- **Future Directions:** Exploring potential future developments in DLT applications for education.

- **Research and Innovation:** Current and future research initiatives in the field of DLT and educational technology.

These courses provide a comprehensive understanding of distributed ledger technology applications in educational technology, equipping students with the knowledge and skills to innovate and lead in this rapidly evolving field.

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22 topics

22.1.Master's in Adult Education Services

This course is designed for educators and professionals aspiring to excel in the field of adult education. It focuses on teaching strategies, curriculum design, assessment methods, and the unique needs and challenges faced by adult learners. The course aims to prepare students to effectively design and implement educational programs that cater to adult learners in various settings.

22.1.Introduction to Adult Education

An overview of the principles and practices in adult education, including historical perspectives and modern developments.

22.2.Theories of Adult Learning

Exploration of key theories such as Andragogy, Transformative Learning, and Experiential Learning that inform adult education practices.

22.3.Curriculum Design for Adult Learners

Techniques and strategies for developing effective curricula tailored to adult learners' needs and goals.

22.4.Assessment and Evaluation in Adult Education

Methods for assessing adult learners' progress and program effectiveness, including formative and summative evaluation.

22.5.Technology Integration in Adult Learning

Utilizing digital tools and technologies to enhance adult learning experiences.

22.6.Diversity and Inclusion in Adult Education

Addressing the diverse backgrounds, identities, and learning styles of adult learners.

22.7.Motivational Strategies for Adult Learners

Strategies to engage and motivate adult learners, fostering a positive and productive learning environment.

22.8.Professional Development for Adult Educators

Resources and strategies for ongoing professional growth and development in adult education.-

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22.2 Introduction to Adult Education

An overview of the principles and practices in adult education, including historical perspectives and modern developments.

Key Topics:

- **Principles of Adult Education:** Understanding the foundational principles guiding adult education.
- **Historical Perspectives:** Tracing the evolution of adult education practices.
- **Modern Developments:** Exploring recent advancements and trends in adult education.

22.3 Theories of Adult Learning

Exploration of key theories such as Andragogy, Transformative Learning, and Experiential Learning that inform adult education practices.

Key Topics:

- **Andragogy:** Principles of adult learning introduced by Malcolm Knowles.
- **Transformative Learning:** How transformative experiences foster deep learning in adults.
- **Experiential Learning:** The role of hands-on experiences and reflection in adult learning.

22.4 Curriculum Design for Adult Learners

Techniques and strategies for developing effective curricula tailored to adult learners' needs and goals.

Key Topics:

- **Needs Assessment:** Identifying the learning needs of adult learners.
- **Curriculum Planning:** Creating structured and flexible curricula that accommodate adult learners.
- **Instructional Strategies:** Implementing various teaching methods to enhance learning.

22.5 Assessment and Evaluation in Adult Education

Methods for assessing adult learners' progress and program effectiveness, including formative and summative evaluation.

Key Topics:

- **Formative Assessment:** Techniques for ongoing assessment to support learning.
- **Summative Evaluation:** Evaluating learner outcomes at the end of a program.
- **Program Effectiveness:** Measuring the success and impact of adult education programs.

22.6 Technology Integration in Adult Learning

Utilizing digital tools and technologies to enhance adult learning experiences.

Key Topics:

- **E-Learning Platforms:** Using online platforms to deliver educational content.
- **Blended Learning:** Combining face-to-face and online learning methods.
- **Tech Tools:** Incorporating various digital tools to support teaching and learning.

22.7 Diversity and Inclusion in Adult Education

Addressing the diverse backgrounds, identities, and learning styles of adult learners.

Key Topics:

- **Cultural Competence:** Understanding and respecting cultural differences in the classroom.
- **Inclusive Practices:** Implementing strategies to create inclusive learning environments.
- **Learning Styles:** Adapting teaching methods to accommodate different learning styles.

22.8 Motivational Strategies for Adult Learners

Strategies to engage and motivate adult learners, fostering a positive and productive learning environment.

Key Topics:

- **Motivational Theories:** Exploring theories that explain adult learner motivation.
- **Engagement Techniques:** Practical strategies to keep adult learners engaged.

- **Supportive Environment:** Creating a learning environment that encourages persistence and success.

22.9 Professional Development for Adult Educators

Resources and strategies for ongoing professional growth and development in adult education.

Key Topics:

- **Continuing Education:** Opportunities for adult educators to enhance their skills and knowledge.
- **Professional Networks:** Building and leveraging networks for support and growth.
- **Reflective Practice:** Encouraging self-reflection to improve teaching practices.

These courses provide a comprehensive understanding of adult education services, equipping educators with the knowledge and skills to effectively design and implement programs tailored to adult learners.

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23 topics

23.1Quantum Computing in Systems Engineering

This course provides an in-depth exploration of quantum computing principles and their applications within the field of systems engineering. Students will gain a comprehensive understanding of both theoretical foundations and practical implementations of quantum technologies in designing and optimizing complex systems.

23.1.Introduction to Quantum Computing

An overview of the principles of quantum mechanics that form the basis of quantum computing technology, including qubits, superposition, and entanglement.

23.2.Quantum Algorithms

Detailed study of key quantum algorithms such as Shor's algorithm and Grover's algorithm, and their implications for solving complex computational problems.

22.3.Quantum Gates and Circuits

Exploration of fundamental quantum gates and the construction of quantum circuits to perform computational tasks using qubits.

22.4.Quantum Information Theory

Understanding the theoretical underpinnings of how quantum mechanics enhances information processing capabilities in systems engineering.

22.5.Quantum Computing Platforms

Introduction to current quantum computing platforms and hardware, including superconducting qubits and trapped ions.

22.6.Quantum Programming Languages

Learning and applying quantum programming languages such as Qiskit, Cirq, and Q# to develop quantum algorithms.

22.7.Applications of Quantum Computing in Systems Engineering

Investigation of potential applications of quantum computing in systems engineering, including optimization, simulation, and cryptography.

22.8.Challenges and Future of Quantum Computing

Discussion on the current challenges facing the field of quantum computing and potential directions for future research and development.

22.9.Quantum Supremacy and its Implications

Examination of the concept of quantum supremacy and its potential to revolutionize computing systems.

23.1 Quantum Computing in Systems Engineering

This course provides an in-depth exploration of quantum computing principles and their applications within the field of systems engineering. Students will gain a comprehensive understanding of both theoretical foundations and practical implementations of quantum technologies in designing and optimizing complex systems.

23.1 Introduction to Quantum Computing

An overview of the principles of quantum mechanics that form the basis of quantum computing technology, including qubits, superposition, and entanglement.

Key Topics:

- **Qubits:** Understanding the basic unit of quantum information.
- **Superposition:** How qubits can exist in multiple states simultaneously.
- **Entanglement:** The phenomenon where qubits become interconnected and the state of one affects the state of another.

23.2 Quantum Algorithms

Detailed study of key quantum algorithms such as Shor's algorithm and Grover's algorithm, and their implications for solving complex computational problems.

Key Topics:

- **Shor's Algorithm:** How it factors large numbers exponentially faster than classical algorithms.
- **Grover's Algorithm:** Quantum search algorithm providing quadratic speedup.
- **Implications:** Potential applications in cryptography, optimization, and more.

23.3 Quantum Gates and Circuits

Exploration of fundamental quantum gates and the construction of quantum circuits to perform computational tasks using qubits.

Key Topics:

- **Quantum Gates:** Basic gates such as Pauli-X, Hadamard, and CNOT.
- **Quantum Circuits:** Building and understanding circuits composed of quantum gates.

- **Quantum Operations:** Executing operations and measuring results.

23.4 Quantum Information Theory

Understanding the theoretical underpinnings of how quantum mechanics enhances information processing capabilities in systems engineering.

Key Topics:

- **Quantum Entropy:** Measures of information and uncertainty in quantum systems.
- **Quantum Error Correction:** Techniques to protect quantum information from errors.
- **Quantum Channels:** Understanding communication channels in quantum information theory.

23.5 Quantum Computing Platforms

Introduction to current quantum computing platforms and hardware, including superconducting qubits and trapped ions.

Key Topics:

- **Superconducting Qubits:** How they work and their role in quantum computers.
- **Trapped Ions:** Another leading technology for building quantum computers.
- **Quantum Hardware:** Overview of different types of quantum computing hardware.

23.6 Quantum Programming Languages

Learning and applying quantum programming languages such as Qiskit, Cirq, and Q# to develop quantum algorithms.

Key Topics:

- **Qiskit:** IBM's open-source quantum computing framework.
- **Cirq:** Google's framework for developing quantum algorithms.

- **Q#:** Microsoft's quantum programming language.
- **Algorithm Development:** Writing and testing quantum algorithms.

23.7 Applications of Quantum Computing in Systems Engineering

Investigation of potential applications of quantum computing in systems engineering, including optimization, simulation, and cryptography.

Key Topics:

- **Optimization:** Using quantum computing to solve complex optimization problems.
- **Simulation:** Quantum simulations of physical systems.
- **Cryptography:** How quantum computing can enhance or break cryptographic systems.

23.8 Challenges and Future of Quantum Computing

Discussion on the current challenges facing the field of quantum computing and potential directions for future research and development.

Key Topics:

- **Scalability:** Challenges in scaling up quantum computers.
- **Decoherence:** Addressing the issue of qubit stability over time.
- **Future Research:** Directions for advancements in quantum computing technology.

23.9 Quantum Supremacy and its Implications

Examination of the concept of quantum supremacy and its potential to revolutionize computing systems.

Key Topics:

- **Quantum Supremacy:** Understanding what it means for a quantum computer to outperform classical computers.
- **Implications:** The potential impact on various industries and fields.

- **Milestones:** Significant achievements in reaching quantum supremacy.

These courses provide a comprehensive understanding of quantum computing in systems engineering, equipping students with the knowledge and skills to innovate and lead in this rapidly evolving field.

23.1 topics:

23.2.Neurotechnology in Educational Technology

This course explores the intersection of neurotechnology and educational technology, focusing on how advances in brain research and interface technologies can enhance learning experiences and outcomes. Students will delve into theoretical aspects, practical applications, as well as ethical implications of utilizing neurotechnology in education.

23.3.Introduction to Neurotechnology

This topic provides a foundational understanding of neurotechnology, including its history, development, and current state of the art. Students will learn about various devices and technologies used in neurotechnology.

23.4.Neuroscience Basics for Educators

An overview of essential neuroscience principles necessary for understanding how neurotechnology can be applied in educational contexts, focusing on brain structure and function in learning.

23.5.Brain-Computer Interfaces in Education

Examine how Brain-Computer Interfaces (BCIs) can be used to facilitate learning, including current applications and future possibilities.

23.6.Cognitive Load Theory and Neurotechnology

Understand how cognitive load theory informs the design of neurotechnology applications in learning environments.

23.7.Neuroscience-Based Adaptive Learning Technologies

Explore how adaptive learning technologies informed by neuroscience can personalize and enhance educational experiences.

23.8.Ethical and Social Implications

Consider the ethical and social implications of using neurotechnology in educational settings, including privacy concerns and consent.

23.9.Case Studies in Neurotechnology Education

Review real-world case studies where neurotechnology has been applied within educational contexts and assess their outcomes.

23.10.Future Trends in Neurotechnology for Education

Discuss and predict future trends in the deployment of neurotechnology for educational purposes, driven by technological and scientific advancements.

23.2 Neurotechnology in Educational Technology

This course explores the intersection of neurotechnology and educational technology, focusing on how advances in brain research and interface technologies can enhance learning experiences and outcomes. Students will delve into theoretical aspects, practical applications, as well as ethical implications of utilizing neurotechnology in education.

23.3 Introduction to Neurotechnology

This topic provides a foundational understanding of neurotechnology, including its history, development, and current state of the art. Students will learn about various devices and technologies used in neurotechnology.

Key Topics:

- **History and Development:** Tracing the evolution of neurotechnology from its inception to current advancements.
- **Devices and Technologies:** Overview of brain-computer interfaces (BCIs), neuroimaging tools, and neurofeedback devices.
- **Current State:** Understanding the latest innovations and applications in neurotechnology.

23.4 Neuroscience Basics for Educators

An overview of essential neuroscience principles necessary for understanding how neurotechnology can be applied in educational contexts, focusing on brain structure and function in learning.

Key Topics:

- **Brain Structure:** Understanding the anatomy of the brain and its relevance to learning.
- **Brain Function:** Exploring how different brain regions contribute to cognitive processes.
- **Neuroplasticity:** The brain's ability to adapt and reorganize, crucial for learning and memory.

23.5 Brain-Computer Interfaces in Education

Examine how Brain-Computer Interfaces (BCIs) can be used to facilitate learning, including current applications and future possibilities.

Key Topics:

- **BCI Technology:** Understanding how BCIs work and their potential in education.
- **Current Applications:** Examples of BCIs being used to aid learning and accessibility.
- **Future Possibilities:** Exploring innovative ways BCIs could transform education.

23.6 Cognitive Load Theory and Neurotechnology

Understand how cognitive load theory informs the design of neurotechnology applications in learning environments.

Key Topics:

- **Cognitive Load Theory:** Basics of cognitive load and its impact on learning.
- **Application Design:** Designing neurotechnology tools that optimize cognitive load.

- **Practical Examples:** Implementing cognitive load principles in educational technology.

23.7 Neuroscience-Based Adaptive Learning Technologies

Explore how adaptive learning technologies informed by neuroscience can personalize and enhance educational experiences.

Key Topics:

- **Adaptive Learning:** Principles and benefits of adaptive learning systems.
- **Neuroscience Insights:** How neuroscience informs the design of adaptive learning technologies.
- **Personalization:** Creating personalized learning experiences based on cognitive and neurological data.

23.8 Ethical and Social Implications

Consider the ethical and social implications of using neurotechnology in educational settings, including privacy concerns and consent.

Key Topics:

- **Ethical Considerations:** Addressing issues such as data privacy, informed consent, and potential biases.
- **Social Implications:** Understanding the broader impact of neurotechnology on society and education.
- **Regulatory Frameworks:** Overview of regulations governing the use of neurotechnology in education.

23.9 Case Studies in Neurotechnology Education

Review real-world case studies where neurotechnology has been applied within educational contexts and assess their outcomes.

Key Topics:

- **Case Studies:** Detailed examination of successful neurotechnology implementations in education.

- **Outcomes Assessment:** Evaluating the effectiveness and impact of neurotechnology on learning outcomes.
- **Lessons Learned:** Key takeaways and best practices from real-world examples.

23.10 Future Trends in Neurotechnology for Education

Discuss and predict future trends in the deployment of neurotechnology for educational purposes, driven by technological and scientific advancements.

Key Topics:

- **Emerging Trends:** Identifying new and upcoming trends in neurotechnology and education.
- **Future Directions:** Exploring potential future developments and innovations.
- **Research and Innovation:** Current and future research initiatives in the field of neurotechnology for education.

These courses provide a comprehensive understanding of neurotechnology applications in educational technology, equipping students with the knowledge and skills to innovate and lead in this rapidly evolving field.

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25. topics

24.1.Robotic Process Automation in Electrochemical Engineering

This course explores the integration of Robotic Process Automation (RPA) within the field of Electrochemical Engineering. The course provides a comprehensive understanding of how automation technologies can enhance efficiency, accuracy, and productivity in electrochemical processes, ranging from battery manufacturing to fuel cell production. Students will gain skills in designing, implementing, and managing automated processes in electrochemical settings.

24.2Introduction to Robotic Process Automation

This module introduces the fundamentals of RPA, covering its history, benefits, and applications across various industries.

24.3.Fundamentals of Electrochemical Engineering

Explore the core principles of electrochemical engineering, including electrochemistry, materials science, and process design.

24.4.RPA Tools and Platforms

Gain insights into popular RPA tools and platforms like UiPath, Automation Anywhere, and Blue Prism. Understand their capabilities and use cases.

24.5.Automating Electrochemical Process Controls

Study the application of RPA in automating the control systems within electrochemical processes, improving precision and efficiency.

24.6.Data Collection and Analysis in Electrochemical Systems

Learn how RPA can facilitate data collection, analysis, and reporting in electrochemical systems, enhancing decision-making capabilities.

24.7.Machine Learning and RPA in Electrochemical Engineering

Explore the intersection of machine learning and RPA in electrochemical engineering for predictive maintenance and process optimization.

24.8.RPA Implementation Challenges and Solutions

Discuss the challenges faced during the implementation of RPA in electrochemical engineering and explore potential solutions.

24.9.Case Studies and Industry Applications

Analyze various case studies to understand how RPA has been applied successfully in the field of electrochemical engineering across different sectors.

4.1 Robotic Process Automation in Electrochemical Engineering

This course explores the integration of Robotic Process Automation (RPA) within the field of Electrochemical Engineering. The course provides a comprehensive understanding of how automation technologies can enhance efficiency, accuracy, and productivity in electrochemical processes, ranging from battery manufacturing to fuel cell production. Students will gain skills in designing, implementing, and managing automated processes in electrochemical settings.

24.2 Introduction to Robotic Process Automation

This module introduces the fundamentals of RPA, covering its history, benefits, and applications across various industries.

Key Topics:

- **History of RPA:** Understanding the origins and evolution of robotic process automation.
- **Benefits:** Exploring the advantages of RPA, such as increased efficiency, reduced errors, and cost savings.
- **Applications:** Examining how RPA is used in various industries, including finance, healthcare, and manufacturing.

24.3 Fundamentals of Electrochemical Engineering

Explore the core principles of electrochemical engineering, including electrochemistry, materials science, and process design.

Key Topics:

- **Electrochemistry Basics:** Understanding the chemical processes involved in electrochemical reactions.
- **Materials Science:** Studying the properties and behaviors of materials used in electrochemical systems.
- **Process Design:** Designing efficient and effective electrochemical processes.

24.4 RPA Tools and Platforms

Gain insights into popular RPA tools and platforms like UiPath, Automation Anywhere, and Blue Prism. Understand their capabilities and use cases.

Key Topics:

- **UiPath:** Overview of UiPath's features and applications.
- **Automation Anywhere:** Exploring Automation Anywhere's capabilities and use cases.
- **Blue Prism:** Understanding Blue Prism's tools and how they are used in RPA.

24.5 Automating Electrochemical Process Controls

Study the application of RPA in automating the control systems within electrochemical processes, improving precision and efficiency.

Key Topics:

- **Control Systems Automation:** Techniques for automating control systems in electrochemical processes.
- **Precision and Efficiency:** Enhancing precision and efficiency through automation.
- **Real-World Applications:** Examples of automated control systems in electrochemical engineering.

24.6 Data Collection and Analysis in Electrochemical Systems

Learn how RPA can facilitate data collection, analysis, and reporting in electrochemical systems, enhancing decision-making capabilities.

Key Topics:

- **Data Collection:** Techniques for automating data collection in electrochemical systems.
- **Data Analysis:** Using RPA to analyze data and generate insights.
- **Reporting:** Automating the generation of reports to support decision-making.

24.7 Machine Learning and RPA in Electrochemical Engineering

Explore the intersection of machine learning and RPA in electrochemical engineering for predictive maintenance and process optimization.

Key Topics:

- **Predictive Maintenance:** Using machine learning and RPA for predictive maintenance of electrochemical systems.
- **Process Optimization:** Enhancing process efficiency and effectiveness through machine learning and RPA.
- **Case Studies:** Real-world examples of machine learning and RPA in electrochemical engineering.

24.8 RPA Implementation Challenges and Solutions

Discuss the challenges faced during the implementation of RPA in electrochemical engineering and explore potential solutions.

Key Topics:

- **Implementation Challenges:** Identifying common challenges in RPA implementation.
- **Solutions:** Exploring strategies to overcome implementation challenges.
- **Best Practices:** Establishing best practices for successful RPA implementation.

24.9 Case Studies and Industry Applications

Analyze various case studies to understand how RPA has been applied successfully in the field of electrochemical engineering across different sectors.

Key Topics:

- **Case Studies:** Detailed analysis of successful RPA implementations in electrochemical engineering.
- **Industry Applications:** Exploring how different sectors use RPA in electrochemical processes.

- **Lessons Learned:** Understanding the key takeaways from real-world applications.

These courses provide a comprehensive understanding of robotic process automation in electrochemical engineering, equipping students with the knowledge and skills to enhance efficiency, accuracy, and productivity in this field

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25.1topics

25.1.Integrating Educational Technology in Renewable Energy Studies

This course is designed for master's students interested in combining the fields of renewable energy and educational technology. It explores the role of technology in educating and informing about renewable energy, examining innovative teaching tools and strategies. Students will learn how to develop technology-driven educational materials and experiences aimed at increasing awareness, understanding, and adoption of renewable energy concepts.

25.2.Introduction to Renewable Energy

An overview of various renewable energy sources, including solar, wind, hydroelectric, and geothermal. Discussions will include the benefits and challenges of each type along with their current global usage.

25.3.Educational Technology Tools

Examines the digital tools and platforms available for creating engaging learning

25.4.Designing Interactive Learning Modules

This topic covers the methodologies and best practices for designing interactive and immersive learning modules using educational technology.

25.5.Gamification in Renewable Energy Education

Explores the concept of gamification and how game-like elements can enhance learning in renewable energy courses.

25.6.Virtual Labs and Simulations

Discusses the role of virtual labs and simulations in teaching complex renewable energy concepts.

25.7.Assessing Learner Outcomes in Technology-Driven Curriculum

This topic focuses on developing assessment strategies for technology-enhanced renewable energy education.

25.8.Case Studies in Renewable Energy Education

Analyzes real-world examples of successful renewable energy educational programs and the role of technology in their delivery.

25.9.Challenges in Integrating Technology and Renewable Energy Education

Addresses common challenges faced when integrating technology into renewable energy education and potential solution

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25.1 Integrating Educational Technology in Renewable Energy Studies

This course is designed for master's students interested in combining the fields of renewable energy and educational technology. It explores the role of technology in educating and informing about renewable energy, examining innovative teaching tools and strategies. Students will learn how to develop technology-driven educational materials and experiences aimed at increasing awareness, understanding, and adoption of renewable energy concepts.

25.2 Introduction to Renewable Energy

An overview of various renewable energy sources, including solar, wind, hydroelectric, and geothermal. Discussions will include the benefits and challenges of each type along with their current global usage.

Key Topics:

- **Solar Energy:** Principles, benefits, challenges, and global usage.
- **Wind Energy:** How wind power works, its advantages, and current implementation.

- **Hydroelectric Energy:** Understanding the mechanics and impact of hydroelectric power.
- **Geothermal Energy:** Exploring how geothermal energy is harnessed and its benefits.

25.3 Educational Technology Tools

Examines the digital tools and platforms available for creating engaging learning experiences.

Key Topics:

- **Digital Learning Platforms:** Overview of tools like Moodle, Canvas, and Google Classroom.
- **Interactive Tools:** Utilizing tools like Kahoot, Quizlet, and interactive whiteboards.
- **Content Creation:** Software for creating educational content, such as Adobe Captivate and Articulate Storyline.

25.4 Designing Interactive Learning Modules

This topic covers the methodologies and best practices for designing interactive and immersive learning modules using educational technology.

Key Topics:

- **Module Design:** Principles of designing effective interactive learning modules.
- **Immersive Learning:** Techniques to create immersive learning experiences.
- **Best Practices:** Strategies to enhance engagement and retention through interactivity.

25.5 Gamification in Renewable Energy Education

Explores the concept of gamification and how game-like elements can enhance learning in renewable energy courses.

Key Topics:

- **Gamification Principles:** Understanding the basics of gamification and its educational benefits.
- **Application in Education:** Implementing game elements like points, badges, and leaderboards in renewable energy education.
- **Impact on Learning:** How gamification improves motivation and engagement.

25.6 Virtual Labs and Simulations

Discusses the role of virtual labs and simulations in teaching complex renewable energy concepts.

Key Topics:

- **Virtual Labs:** Benefits and examples of virtual labs in renewable energy education.
- **Simulations:** Using simulations to teach and experiment with renewable energy concepts.
- **Implementation:** Best practices for integrating virtual labs and simulations into the curriculum.

25.7 Assessing Learner Outcomes in Technology-Driven Curriculum

This topic focuses on developing assessment strategies for technology-enhanced renewable energy education.

Key Topics:

- **Assessment Methods:** Different methods for assessing learner outcomes in tech-driven education.
- **Formative and Summative Assessment:** Utilizing both to measure progress and final understanding.
- **Data Analysis:** Using data from assessments to improve teaching strategies and learning outcomes.

25.8 Case Studies in Renewable Energy Education

Analyzes real-world examples of successful renewable energy educational programs and the role of technology in their delivery.

Key Topics:

- **Case Studies:** Detailed analysis of successful implementations of educational technology in renewable energy programs.
- **Technology's Role:** Understanding how technology facilitated learning and engagement.
- **Lessons Learned:** Key takeaways and best practices from real-world examples.

25.9 Challenges in Integrating Technology and Renewable Energy Education

Addresses common challenges faced when integrating technology into renewable energy education and potential solutions.

Key Topics:

- **Common Challenges:** Identifying barriers such as funding, access to technology, and teacher training.
- **Solutions:** Strategies to overcome these challenges.
- **Future Directions:** Exploring future trends and innovations in the field.

These courses provide a comprehensive understanding of how educational technology can be integrated into renewable energy studies, equipping students with the knowledge and skills to innovate and lead in this interdisciplinary fi

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26.1

26.1Wholesale Trade Management in Industrial Engineering

This course is designed for students pursuing a Master's degree in Industrial Engineering with a focus on wholesale trade. It will cover the essential aspects of wholesale trade management, including supply chain dynamics, inventory control, logistics, procurement, and market analysis.

The course will blend technical engineering concepts with business strategies to enable students to effectively manage and innovate within the wholesale trade sector.

26.2.Introduction to Wholesale Trade

Explore the fundamentals of wholesale trade, its role in the supply chain, and the economic impact on industrial markets.

26.3.Supply Chain Dynamics

Understand the complexities of supply chain management, including network design, integration, and leveraging technology for efficiency.

26.4.Inventory Control Methods

Study various inventory management techniques, such as Just-In-Time, Economic Order Quantity, and ABC analysis to optimize stock levels.

26.5.Logistics and Distribution

Examine the logistics involved in wholesale trade, focusing on distribution networks, transportation management, and warehousing solutions.

26.6.Procurement Strategies

Learn about procurement processes and strategies, vendor selection, and relationship management to secure effective supply sources.

26.7.Market Analysis and Forecasting

Study techniques for market analysis, trend observation, and forecasting methods to drive strategic decisions in wholesale trade.

27.8.Risk Management in Wholesale Trade

Analyze risk management principles, identifying potential risks in the wholesale supply chain and developing mitigation strategies.

27.9.Regulatory and Ethical Considerations

Explore the regulatory landscape affecting wholesale trade and the ethical considerations of operating within the sector.

26.1 Wholesale Trade Management in Industrial Engineering

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26.2 Introduction to Wholesale Trade

Explore the fundamentals of wholesale trade, its role in the supply chain, and the economic impact on industrial markets.

Key Topics:

- **Fundamentals:** Understanding the basics of wholesale trade.
- **Role in Supply Chain:** How wholesale trade fits within the broader supply chain.
- **Economic Impact:** Examining the economic significance of wholesale trade on industrial markets.

26.3 Supply Chain Dynamics

Understand the complexities of supply chain management, including network design, integration, and leveraging technology for efficiency.

Key Topics:

- **Network Design:** Principles of designing efficient supply chain networks.
- **Integration:** Integrating various components of the supply chain for seamless operations.
- **Technology:** Utilizing technology to enhance supply chain efficiency.

26.4 Inventory Control Methods

Study various inventory management techniques, such as Just-In-Time, Economic Order Quantity, and ABC analysis to optimize stock levels.

Key Topics:

- **Just-In-Time (JIT):** Minimizing inventory holding costs by receiving goods only as needed.
- **Economic Order Quantity (EOQ):** Calculating the optimal order quantity to minimize total inventory costs.
- **ABC Analysis:** Categorizing inventory to prioritize management efforts.

26.5 Logistics and Distribution

Examine the logistics involved in wholesale trade, focusing on distribution networks, transportation management, and warehousing solutions.

Key Topics:

- **Distribution Networks:** Designing and managing distribution networks.
- **Transportation Management:** Efficiently managing transportation logistics.
- **Warehousing Solutions:** Implementing effective warehousing strategies.

26.6 Procurement Strategies

Learn about procurement processes and strategies, vendor selection, and relationship management to secure effective supply sources.

Key Topics:

- **Procurement Processes:** Understanding procurement procedures and best practices.
- **Vendor Selection:** Criteria for selecting and evaluating vendors.
- **Relationship Management:** Building and maintaining strong supplier relationships.

26.7 Market Analysis and Forecasting

Study techniques for market analysis, trend observation, and forecasting methods to drive strategic decisions in wholesale trade.

Key Topics:

- **Market Analysis:** Techniques for analyzing market conditions and trends.
- **Trend Observation:** Identifying and interpreting market trends.
- **Forecasting Methods:** Using quantitative and qualitative methods to predict future market conditions.

26.8 Risk Management in Wholesale Trade

Analyze risk management principles, identifying potential risks in the wholesale supply chain and developing mitigation strategies.

Key Topics:

- **Risk Identification:** Identifying potential risks in the supply chain.
- **Mitigation Strategies:** Developing strategies to mitigate identified risks.
- **Risk Management Frameworks:** Implementing risk management frameworks to ensure supply chain resilience.

26.9 Regulatory and Ethical Considerations

Understand the regulatory and ethical considerations in wholesale trade, including compliance with laws and promoting ethical business practices.

Key Topics:

- **Regulatory Compliance:** Ensuring adherence to relevant laws and regulations.
- **Ethical Business Practices:** Promoting ethical behavior and corporate social responsibility.
- **Case Studies:** Analyzing real-world examples of regulatory and ethical challenges in wholesale trade.

These courses provide a comprehensive understanding of wholesale trade management in industrial engineering, equipping students with the knowledge and skills to effectively manage and innovate within the wholesale trade sector.

28.topics

29. 1.Advanced Wireless Communications

This course explores the fundamental principles and advanced techniques of wireless communications, designed for students in electronic engineering. It covers critical concepts, system designs, and the latest advancements in wireless technologies to prepare students for careers in the telecommunications industry.

29.2.Introduction to Wireless Communications

Overview of wireless communication systems, historical developments, and contemporary applications.

29.3.Radio Frequency Fundamentals

Exploration of radio frequency (RF) spectrum, key RF principles, and their application in wireless communication.

29.4.Wireless Signal Propagation

Understanding the behavior of wireless signals over various media and environments, including path loss, fading, and interference.

29.5.Multiple Access Techniques

Survey of multiple access schemes including FDMA, TDMA, CDMA, and OFDMA, which enable multiple users to share the same frequency band.

29.6.Wireless Networking and Protocols

Introduction to wireless network design, including protocol layers, network architectures, and routing protocols.

29.7.Cellular Systems and 5G

In-depth analysis of cellular network architecture, with a focus on the evolution from 1G to 5G, and future trends.

29.8..Antenna Theory and Design

Study of antenna characteristics, types, and their utilization in wireless communication systems.

29.8Wireless Security

Exploration of security challenges and solutions in wireless communications, including encryption and authentication methodologies.

29.6IoT and Wireless Sensor Networks

Examination of Internet of Things (IoT) concepts, architectures, and the role of wireless sensor networks in IoT implementations.

29.1 Advanced Wireless Communications

This course explores the fundamental principles and advanced techniques of wireless communications, designed for students in electronic engineering. It covers critical concepts, system designs, and the latest advancements in wireless technologies to prepare students for careers in the telecommunications industry.

29.2 Introduction to Wireless Communications

Overview of wireless communication systems, historical developments, and contemporary applications.

Key Topics:

- **Wireless Communication Systems:** Basic principles and components of wireless communication systems.
- **Historical Developments:** Key milestones in the evolution of wireless communications.
- **Contemporary Applications:** Current uses of wireless technology in various fields.

29.3 Radio Frequency Fundamentals

Exploration of radio frequency (RF) spectrum, key RF principles, and their application in wireless communication.

Key Topics:

- **RF Spectrum:** Understanding the RF spectrum and its allocation.

- **RF Principles:** Basics of RF communication, including modulation and demodulation.
- **Applications:** Practical uses of RF technology in wireless communication.

29.4 Wireless Signal Propagation

Understanding the behavior of wireless signals over various media and environments, including path loss, fading, and interference.

Key Topics:

- **Signal Propagation:** How wireless signals travel through different media.
- **Path Loss:** Factors affecting the attenuation of signal strength.
- **Fading and Interference:** Understanding and mitigating fading and interference effects.

29.5 Multiple Access Techniques

Survey of multiple access schemes including FDMA, TDMA, CDMA, and OFDMA, which enable multiple users to share the same frequency band.

Key Topics:

- **FDMA (Frequency Division Multiple Access):** Assigning different frequency bands to multiple users.
- **TDMA (Time Division Multiple Access):** Allocating time slots to multiple users on the same frequency.
- **CDMA (Code Division Multiple Access):** Using unique codes to differentiate users sharing the same frequency.
- **OFDMA (Orthogonal Frequency Division Multiple Access):** Combining multiple sub-carriers to improve efficiency and performance.

29.6 Wireless Networking and Protocols

Introduction to wireless network design, including protocol layers, network architectures, and routing protocols.

Key Topics:

- **Protocol Layers:** Understanding the different layers in wireless communication protocols.
- **Network Architectures:** Designing and implementing wireless network architectures.
- **Routing Protocols:** Overview of routing protocols used in wireless networks.

29.7 Cellular Systems and 5G

In-depth analysis of cellular network architecture, with a focus on the evolution from 1G to 5G, and future trends.

Key Topics:

- **Cellular Network Architecture:** Structure and components of cellular networks.
- **1G to 5G Evolution:** Historical progression and key features of each generation.
- **Future Trends:** Emerging technologies and advancements in cellular communications.

29.8 Antenna Theory and Design

Study of antenna characteristics, types, and their utilization in wireless communication systems.

Key Topics:

- **Antenna Characteristics:** Key parameters and performance metrics of antennas.
- **Types of Antennas:** Different types of antennas used in wireless communication.
- **Design and Utilization:** Designing and deploying antennas for optimal performance.

29.9 Wireless Security

Exploration of security challenges and solutions in wireless communications, including encryption and authentication methodologies.

Key Topics:

- **Security Challenges:** Identifying common security threats in wireless communication.
- **Encryption:** Techniques for securing wireless communication through encryption.
- **Authentication:** Methods for verifying the identity of users and devices.

29.10 IoT and Wireless Sensor Networks

Examination of Internet of Things (IoT) concepts, architectures, and the role of wireless sensor networks in IoT implementations.

Key Topics:

- **IoT Concepts:** Understanding the basic principles and applications of IoT.
- **Architectures:** Designing IoT systems and integrating wireless sensor networks.
- **Wireless Sensor Networks:** Deploying and managing sensor networks for IoT applications.

These courses provide a comprehensive understanding of advanced wireless communications, equipping students with the knowledge and skills to excel in the telecommunications industry.

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30 topics

30.1.Advanced Electrical Engineering in Construction and Civil Engineering

This course provides an in-depth understanding of electrical engineering principles and their applications in construction and civil engineering. Students will learn about the integration of electrical systems within construction projects, the challenges of implementing sustainable energy

solutions, and the latest technologies in the field. Emphasis is placed on practical analysis, design, and problem-solving skills necessary for modern construction projects.

30.2. Fundamentals of Electrical Systems in Construction

Overview of electrical systems essential in construction projects, including power distribution, lighting, and wiring systems.

30.3.Electrical Safety Standards and Codes

Detailed study of electrical safety standards, codes, and regulations specific to construction sites.

30.4.Integration of Electrical Systems in Building Design

Techniques for integrating electrical systems with architectural and structural frameworks in buildings.

30.5Sustainable and Renewable Energy Technologies

Exploration of sustainable and renewable energy technologies applicable to construction projects.

30.6.Smart Grids and Intelligent Networks

Study of smart grid technologies and their application in modern urban infrastructure.

30.7.Electrical System Design and Simulation

Practical approaches to the design and simulation of electrical systems for construction projects using industry-standard software.

30.8.Power Quality and Energy Management

Analysis of power quality issues and energy management strategies for improved efficiency.

30.9.Electrical Systems in Infrastructure Projects

Examination of the role of electrical engineering in large-scale infrastructure projects, such as transportation and water systems

Advanced Electrical Engineering in Construction and Civil Engineering

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30.2 Fundamentals of Electrical Systems in Construction

Overview of electrical systems essential in construction projects, including power distribution, lighting, and wiring systems.

Key Topics:

- **Power Distribution:** Understanding the design and implementation of power distribution systems.
- **Lighting Systems:** Techniques for efficient lighting design in construction projects.
- **Wiring Systems:** Best practices for wiring systems, including safety and compliance.

30.3 Electrical Safety Standards and Codes

Detailed study of electrical safety standards, codes, and regulations specific to construction sites.

Key Topics:

- **Safety Standards:** Overview of key electrical safety standards.
- **Codes and Regulations:** Understanding and complying with electrical codes and regulations.
- **Site Safety:** Implementing safety practices on construction sites to prevent electrical hazards.

30.4 Integration of Electrical Systems in Building Design

Techniques for integrating electrical systems with architectural and structural frameworks in buildings.

Key Topics:

- **System Integration:** Strategies for seamlessly integrating electrical systems within building designs.
- **Coordination with Other Trades:** Ensuring coordination between electrical systems and other construction trades.
- **Design Optimization:** Techniques for optimizing electrical designs for efficiency and performance.

30.5 Sustainable and Renewable Energy Technologies

Exploration of sustainable and renewable energy technologies applicable to construction projects.

Key Topics:

- **Solar Energy:** Implementation of solar panels and photovoltaic systems in construction.
- **Wind Energy:** Integrating wind turbines and other wind energy systems.
- **Energy Storage:** Utilizing energy storage solutions such as batteries and thermal storage.

30.6 Smart Grids and Intelligent Networks

Study of smart grid technologies and their application in modern urban infrastructure.

Key Topics:

- **Smart Grid Technologies:** Understanding the components and benefits of smart grids.
- **Intelligent Networks:** Designing and managing intelligent networks for energy distribution.
- **Urban Infrastructure:** Applying smart grid technologies to modern urban infrastructure projects.

30.7 Electrical System Design and Simulation

Practical approaches to the design and simulation of electrical systems for construction projects using industry-standard software.

Key Topics:

- **Design Software:** Tools and software for electrical system design and simulation.
- **Simulation Techniques:** Methods for simulating electrical systems to predict performance.
- **Project Examples:** Case studies of electrical system design and simulation in real-world projects.

30.8 Power Quality and Energy Management

Analysis of power quality issues and energy management strategies for improved efficiency.

Key Topics:

- **Power Quality:** Identifying and addressing power quality issues such as voltage sags, harmonics, and transients.
- **Energy Management:** Strategies for efficient energy management in construction projects.
- **Efficiency Improvement:** Techniques for improving the overall efficiency of electrical systems.

30.9 Electrical Systems in Infrastructure Projects

Examination of the role of electrical engineering in large-scale infrastructure projects, such as transportation and water systems.

Key Topics:

- **Transportation Systems:** Electrical engineering applications in transportation infrastructure.
- **Water Systems:** Designing and managing electrical systems in water treatment and distribution.

- **Infrastructure Projects:** Examples of large-scale infrastructure projects and their electrical requirements.

These courses provide a comprehensive understanding of advanced electrical engineering principles and their application in construction and civil engineering, equipping students with the knowledge and skills to effectivel

Electrical Systems in Construction and Civil Engineering

This master's level course is designed to bridge the fields of construction and civil engineering with electrical engineering principles. Students will learn to integrate electrical systems into construction projects effectively, ensuring safety, efficiency, and innovation in modern infrastructure.

Introduction to Electrical Systems in Construction

Overview of electrical systems integration in construction projects, considering design, installation, and maintenance.

Power Distribution in Buildings

Explore the principles and challenges of power distribution systems in modern buildings, including load assessments and distribution panels.

Lighting Systems and Design

Study the design and implementation of efficient lighting systems in commercial and residential buildings.

Electrical Safety Standards and Regulations

Learn about international and local electrical safety standards and regulations pertinent to construction projects.

Sustainability in Electrical Engineering

Understand sustainable practices and technologies, such as solar power and energy efficiency in construction.

Smart Buildings and IoT Integration

Examine the incorporation of smart technologies and IoT in building systems for improved energy management and automation.

Electrical Load Analysis and Estimation

Learn methods to analyze electrical loads and estimate demand for optimal system design.

Integration of Renewable Energy Sources

Explore the potential of integrating renewable energy sources into construction projects and urban environments.

Project Management in Electrical Engineering

Develop skills in managing electrical engineering projects within the construction industry, focusing on timelines, budgets, and resource allocation.

30.1topics

30.1.Doctorate in Specialist Engineering Infrastructure and Contractors: Electrical Engineering

This advanced course is designed for students pursuing a Doctorate degree in Specialist Engineering Infrastructure and Contractors with a focus on Electrical Engineering. The course aims to equip students with in-depth knowledge and practical skills necessary for the design, implementation, and management of electrical infrastructure projects. Students will explore contemporary challenges, innovative solutions, and emerging technologies in electrical engineering.

30.2.Advanced Power System Analysis

Exploration of power flow analysis, fault analysis, and stability assessment in large-scale electrical power systems with a focus on real-world applications.

30.3Renewable Energy Systems

An in-depth examination of renewable energy technology integration, focusing on wind, solar, and hydroelectric power systems.

30.4.Electrical Infrastructure Design and Management

Comprehensive overview of electrical infrastructure planning, design methodologies, and management practices for efficient operation.

31.5.Smart Grids and IoT Applications

Study of smart grid technology, IoT applications in electrical systems, and their impact on efficiency and sustainability.

31.6..High Voltage Engineering

Analysis of high voltage engineering principles, equipment, and testing methodologies in power transmission.

31.7.Project Management in Electrical Engineering

Principles and practices of effective project management tailored to electrical engineering projects and infrastructure.

31.8Energy Policy and Ethical Considerations

Examination of energy policies, regulatory frameworks, and ethical considerations impacting electrical infrastructure projects.

31.1Sustainable Electrical Engineering Practices

Strategies for incorporating sustainable practices in the planning, design, and execution of electrical engineering projects

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30.1 Doctorate in Specialist Engineering Infrastructure and Contractors: Electrical Engineering

This advanced course is designed for students pursuing a Doctorate degree in Specialist Engineering Infrastructure and Contractors with a focus on Electrical Engineering. The course aims to equip students with in-depth knowledge and practical skills necessary for the design, implementation, and management of electrical infrastructure projects. Students will explore contemporary challenges, innovative solutions, and emerging technologies in electrical engineering.

30.2 Advanced Power System Analysis

Exploration of power flow analysis, fault analysis, and stability assessment in large-scale electrical power systems with a focus on real-world applications.

Key Topics:

- **Power Flow Analysis:** Techniques for analyzing the flow of electrical power in networks.
- **Fault Analysis:** Identifying and mitigating faults in power systems.
- **Stability Assessment:** Evaluating and ensuring the stability of power systems.

30.3 Renewable Energy Systems

An in-depth examination of renewable energy technology integration, focusing on wind, solar, and hydroelectric power systems.

Key Topics:

- **Wind Energy:** Understanding the technology and integration of wind power systems.
- **Solar Energy:** Exploring photovoltaic systems and their applications.
- **Hydroelectric Power:** Implementing hydroelectric systems in renewable energy projects.

30.4 Electrical Infrastructure Design and Management

Comprehensive overview of electrical infrastructure planning, design methodologies, and management practices for efficient operation.

Key Topics:

- **Infrastructure Planning:** Strategies for effective electrical infrastructure planning.
- **Design Methodologies:** Best practices in designing electrical infrastructure.
- **Management Practices:** Techniques for managing and maintaining electrical systems.

31.5 Smart Grids and IoT Applications

Study of smart grid technology, IoT applications in electrical systems, and their impact on efficiency and sustainability.

Key Topics:

- **Smart Grid Technology:** Understanding the components and benefits of smart grids.
- **IoT in Electrical Systems:** Integrating IoT devices to enhance electrical system performance.
- **Efficiency and Sustainability:** Improving efficiency and sustainability through smart grid and IoT applications.

31.6 High Voltage Engineering

Analysis of high voltage engineering principles, equipment, and testing methodologies in power transmission.

Key Topics:

- **High Voltage Principles:** Core principles of high voltage engineering.
- **Equipment:** Understanding high voltage equipment and its applications.
- **Testing Methodologies:** Techniques for testing and ensuring the reliability of high voltage systems.

31.7 Project Management in Electrical Engineering

Principles and practices of effective project management tailored to electrical engineering projects and infrastructure.

Key Topics:

- **Project Planning:** Techniques for planning electrical engineering projects.
- **Resource Management:** Managing resources effectively in electrical projects.
- **Risk Management:** Identifying and mitigating risks in project management.

31.8 Energy Policy and Ethical Considerations

Examination of energy policies, regulatory frameworks, and ethical considerations impacting electrical infrastructure projects.

Key Topics:

- **Energy Policies:** Understanding policies that influence electrical engineering.
- **Regulatory Frameworks:** Complying with regulations in electrical infrastructure projects.
- **Ethical Considerations:** Addressing ethical issues in electrical engineering.

31.9 Sustainable Electrical Engineering Practices

Strategies for incorporating sustainable practices in the planning, design, and execution of electrical engineering projects.

Key Topics:

- **Sustainable Design:** Principles of designing sustainable electrical systems.
- **Energy Efficiency:** Implementing energy-efficient practices in electrical engineering.
- **Environmental Impact:** Reducing the environmental impact of electrical projects.

These courses provide a comprehensive understanding of specialist engineering infrastructure and contractors with a focus on electrical engineering, equipping students with the knowledge and skills to effectively manage and innovate within the field

Admission Ready - Completing your application - Atlantic International University

32.Topic

32.1Clean Energy Technology: Ecotechnology Applications

This course provides an in-depth understanding of clean energy technologies with a focus on ecotechnology. It explores various aspects of renewable energy, sustainable practices, and innovations that contribute to reducing environmental impacts and fostering ecological balance. Students will gain expertise in evaluating and implementing clean energy systems within a framework of ecological sustainability and environmental responsibility.

32.3.Introduction to Clean Energy and Ecotechnology

An overview of clean energy principles, the importance of ecotechnology, and how these fields integrate to promote sustainable development.

32.4.Solar Energy Technologies

Exploration of solar energy systems, including photovoltaic and solar thermal technologies, and their applications in sustainable energy solutions.

32.5.Wind Energy Systems

Study of wind energy generation, the mechanics of wind turbines, and the potential of wind power as a clean energy source.

32.6.Bioenergy and Biomass

Understanding the role of biomass in clean energy systems, including conversion technologies and sustainable biomass sourcing.

32.7.Hydropower and Ocean Energy

Exploration of hydropower technologies and emerging ocean energy systems such as tidal and wave energy, focusing on their ecological impact and potential.

32.8.Geothermal Energy

An examination of geothermal energy technologies, their environmental implications, and their role in global clean energy strategies.

32.9.Energy Storage and Smart Grids

Understanding the role of energy storage technologies and smart grid systems in enhancing the efficiency and reliability of clean energy distribution.

32.10.Policy and Economics of Clean Energy

Analysis of the policies and economic factors that influence clean energy adoption, with a focus on incentivizing ecotechnological innovations.

32.11Ecological Impact of Renewable Energy

Evaluating the ecological impacts of renewable energy projects and the methods to mitigate negative effects on the environment.

32.12.Future Directions in Clean Energy and Ecotechnology

Exploration of upcoming trends and innovations in clean energy and ecotechnology, including research and development prospects.

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This course provides an in-depth understanding of clean energy technologies with a focus on ecotechnology. It explores various aspects of renewable energy, sustainable practices, and innovations that contribute to reducing environmental impacts and fostering ecological balance. Students will gain expertise in evaluating and implementing clean energy systems within a framework of ecological sustainability and environmental responsibility.

32.3 Introduction to Clean Energy and Ecotechnology

An overview of clean energy principles, the importance of ecotechnology, and how these fields integrate to promote sustainable development.

Key Topics:

- **Clean Energy Principles:** Understanding the basic concepts of clean energy.
- **Importance of Ecotechnology:** The role of ecotechnology in achieving sustainable development.
- **Integration:** How clean energy and ecotechnology work together to promote environmental sustainability.

32.4 Solar Energy Technologies

Exploration of solar energy systems, including photovoltaic and solar thermal technologies, and their applications in sustainable energy solutions.

Key Topics:

- **Photovoltaic Systems:** Basics and applications of photovoltaic solar panels.
- **Solar Thermal Technologies:** Understanding solar thermal energy and its uses.
- **Sustainable Solutions:** Implementing solar technologies in sustainable energy projects.

32.5 Wind Energy Systems

Study of wind energy generation, the mechanics of wind turbines, and the potential of wind power as a clean energy source.

Key Topics:

- **Wind Energy Generation:** Principles of generating energy from wind.
- **Wind Turbines:** Mechanics and design of wind turbines.
- **Potential and Applications:** Evaluating the potential of wind power as a renewable energy source.

32.6 Bioenergy and Biomass

Understanding the role of biomass in clean energy systems, including conversion technologies and sustainable biomass sourcing.

Key Topics:

- **Biomass:** Types of biomass used in energy production.
- **Conversion Technologies:** Methods of converting biomass into usable energy.
- **Sustainable Sourcing:** Ensuring sustainable practices in sourcing biomass.

32.7 Hydropower and Ocean Energy

Exploration of hydropower technologies and emerging ocean energy systems such as tidal and wave energy, focusing on their ecological impact and potential.

Key Topics:

- **Hydropower Technologies:** Basics of hydropower generation.
- **Ocean Energy Systems:** Understanding tidal and wave energy technologies.
- **Ecological Impact:** Assessing the ecological effects of hydropower and ocean energy projects.

32.8 Geothermal Energy

An examination of geothermal energy technologies, their environmental implications, and their role in global clean energy strategies.

Key Topics:

- **Geothermal Technologies:** Basics of geothermal energy production.
- **Environmental Implications:** Understanding the impact of geothermal energy on the environment.
- **Global Strategies:** Role of geothermal energy in worldwide clean energy initiatives.

32.9 Energy Storage and Smart Grids

Understanding the role of energy storage technologies and smart grid systems in enhancing the efficiency and reliability of clean energy distribution.

Key Topics:

- **Energy Storage Technologies:** Exploring different types of energy storage solutions.
- **Smart Grids:** Basics of smart grid technology and its benefits.
- **Efficiency and Reliability:** Improving energy distribution through advanced storage and smart grid systems.

32.10 Policy and Economics of Clean Energy

Analysis of the policies and economic factors that influence clean energy adoption, with a focus on incentivizing ecotechnological innovations.

Key Topics:

- **Clean Energy Policies:** Understanding the policy landscape for clean energy.
- **Economic Factors:** Evaluating the economic benefits and challenges of clean energy adoption.
- **Incentives:** Exploring incentives and support mechanisms for ecotechnology innovations.

32.11 Ecological Impact of Renewable Energy

Evaluating the ecological impacts of renewable energy projects and the methods to mitigate negative effects on the environment.

Key Topics:

- **Impact Assessment:** Techniques for assessing the ecological impact of renewable energy projects.
- **Mitigation Strategies:** Methods to reduce the environmental impact of clean energy systems.
- **Best Practices:** Implementing best practices for ecological sustainability in renewable energy.

32.12 Future Directions in Clean Energy and Ecotechnology

Exploration of upcoming trends and innovations in clean energy and ecotechnology, including research and development prospects.

Key Topics:

- **Emerging Trends:** Identifying new trends and innovations in clean energy and ecotechnology.
- **Research and Development:** Current and future research initiatives in the field.

- **Future Prospects:** Predicting future directions and advancements in clean energy and ecotechnology.

These courses provide a comprehensive understanding of clean energy technology and ecotechnology applications, equipping students with the knowledge and skills to innovate and lead in this field.

33.Topics

33.1Integration of Electronic Engineering in Construction and Civil Engineering

This course aims to explore the integration of electronic engineering principles within the domains of construction and civil engineering. The course will cover the utilization of electronic systems for improved construction processes, smart infrastructure, and sustainable development. Students will gain interdisciplinary knowledge and practical skills to innovate and optimize civil engineering projects using electronic solutions.

33.2.Introduction to Electronic Systems in Civil Engineering

This topic provides an overview of the role and importance of electronic systems in the construction and civil engineering industries.

33.3.Smart Construction Technologies

Exploring various smart construction technologies enabled by electronic systems such as sensors, IoT devices, and automation.

33.4.IoT in Infrastructure Management

Understanding how IoT devices are used in managing and monitoring infrastructure and civil engineering projects.

33.5.Electronic Monitoring and Control Systems

This topic covers the usage of electronic systems for monitoring and control within large-scale construction projects.

33.6.Automation in Construction Machinery

Explore how electronic engineering drives the automation of construction machinery for enhanced efficiency and precision.

33.7.Solar and Renewable Energy Systems in Civil Engineering

Investigate how electronic engineering aids in integrating solar and renewable energy systems into modern civil engineering projects.

33.8.Building Information Modeling (BIM) and Electronic Systems

Understand the role of electronic systems in enhancing Building Information Modeling processes.

33.9.Cybersecurity in Smart Infrastructure

Learn about the importance of cybersecurity systems to protect smart civil infrastructure from digital threats.

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33.2 Introduction to Electronic Systems in Civil Engineering

This topic provides an overview of the role and importance of electronic systems in the construction and civil engineering industries.

Key Topics:

- **Role and Importance:** Understanding how electronic systems are essential in modern construction and civil engineering.
- **Applications:** Examples of electronic systems used in these industries.
- **Technological Integration:** How electronic engineering is integrated into construction projects.

33.3 Smart Construction Technologies

Exploring various smart construction technologies enabled by electronic systems such as sensors, IoT devices, and automation.

Key Topics:

- **Sensors:** Use of sensors for real-time monitoring and data collection.
- **IoT Devices:** Implementing IoT devices to create connected construction sites.
- **Automation:** Enhancing construction processes through automation technologies.

33.4 IoT in Infrastructure Management

Understanding how IoT devices are used in managing and monitoring infrastructure and civil engineering projects.

Key Topics:

- **IoT Devices:** Types and functions of IoT devices in infrastructure management.
- **Monitoring:** Techniques for using IoT to monitor infrastructure health and performance.
- **Management:** Strategies for managing infrastructure projects using IoT technologies.

33.5 Electronic Monitoring and Control Systems

This topic covers the usage of electronic systems for monitoring and control within large-scale construction projects.

Key Topics:

- **Monitoring Systems:** Implementing electronic systems to monitor construction activities.
- **Control Systems:** Using electronic control systems to manage construction processes.

- **Large-Scale Projects:** Examples of electronic monitoring and control in large construction projects.

33.6 Automation in Construction Machinery

Explore how electronic engineering drives the automation of construction machinery for enhanced efficiency and precision.

Key Topics:

- **Construction Machinery:** Types of machinery that can be automated.
- **Efficiency and Precision:** Benefits of automation in construction machinery.
- **Technology Integration:** How electronic engineering enables automation in construction equipment.

33.7 Solar and Renewable Energy Systems in Civil Engineering

Investigate how electronic engineering aids in integrating solar and renewable energy systems into modern civil engineering projects.

Key Topics:

- **Solar Energy Systems:** Design and integration of solar energy solutions.
- **Renewable Energy:** Incorporating various renewable energy sources in civil engineering.
- **Sustainability:** Promoting sustainable development through renewable energy systems.

33.8 Building Information Modeling (BIM) and Electronic Systems

Understand the role of electronic systems in enhancing Building Information Modeling processes.

Key Topics:

- **BIM Technology:** Basics and benefits of Building Information Modeling.
- **Electronic Integration:** How electronic systems improve BIM processes.
- **Efficiency and Collaboration:** Enhancing project efficiency and collaboration through BIM.

33.9 Cybersecurity in Smart Infrastructure

Learn about the importance of cybersecurity systems in protecting smart infrastructure from cyber threats.

Key Topics:

- **Cybersecurity Principles:** Understanding the basics of cybersecurity.
- **Smart Infrastructure:** Identifying vulnerabilities in smart infrastructure systems.
- **Protection Strategies:** Implementing cybersecurity measures to protect smart infrastructure.

These courses provide a comprehensive understanding of how electronic engineering can be integrated into construction and civil engineering, equipping students with the knowledge and skills to innovate and optimize projects using electronic solution

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34.1.Topic

34.2.Masters in Immutable Data Storage Solutions for Web Design

This course provides an advanced understanding of immutable data storage solutions specifically tailored for web design. Students will explore the principles of immutable data, analyze different storage solutions, and apply best practices in the context of developing modern, resilient web applications.

34.3.Introduction to Immutable Data

An overview of immutable data, its importance in web design, and basic concepts such as data structures and potential benefits.

33.4.Immutable Data Structures

Discussion on various immutable data structures such as lists, sets, and maps. Understanding their use and advantages in web development.

33.5.Immutable.js and Alternatives

An examination of popular libraries like Immutable.js and other alternatives that offer immutable data structures in JavaScript.

33.6.State Management with Immutable Data

Exploring how immutable data can simplify state management in web applications, with a focus on integrating with popular frameworks.

33.7.Performance Benefits of Immutable Data

Investigating the performance benefits that immutable data can bring to web applications and how these benefits can be maximized.

33.8.GraphQL and Immutable Data

Integrating immutable data with GraphQL endpoints and understanding the implications for web application design.

33.9.Immutable Data in Server-Side Rendering (SSR)

Utilizing immutable data in server-side rendering processes to boost performance and maintain data consistency.

33.10.Security and Immutable Data

Understanding security concerns and best practices when implementing immutable data storage solutions in web applications.

33.11.Future Trends in Immutable Data

Exploring future trends and developments in immutable data storage solutions and how they might impact web design.

Masters in Immutable Data Storage Solutions for Web Design

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34.2 Introduction to Immutable Data

An overview of immutable data, its importance in web design, and basic concepts such as data structures and potential benefits.

Key Topics:

- **Basics of Immutable Data:** Understanding what immutable data is and why it's important.
- **Data Structures:** Exploring the types of data structures used in immutable data.
- **Benefits:** Identifying the potential benefits of using immutable data in web design.

34.3 Immutable Data Structures

Discussion on various immutable data structures such as lists, sets, and maps. Understanding their use and advantages in web development.

Key Topics:

- **Lists:** Using immutable lists and their advantages.
- **Sets:** Implementing immutable sets for unique data storage.
- **Maps:** Exploring the use of immutable maps and their benefits.

34.4

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- **Maps:** Exploring the use of immutable maps and their benefits.

34.4

35.1.Topic

35.2.Advanced Cyber-Physical Systems in Telecommunications

This course explores the intersection of cyber-physical systems and telecommunications, providing an in-depth understanding of how these technologies integrate to create innovative solutions. The course covers the architecture, design, and implementation of next-generation telecommunication systems using cyber-physical components, with a keen focus on real-world applications and research developments.

35.3.Introduction to Cyber-Physical Systems

Understand the core concepts and significance of cyber-physical systems (CPS) in the modern world, particularly in the telecommunications industry.

35.4.Network Architecture in CPS

Study the architectural principles of integrating CPS with telecommunication networks, including topologies, network protocols, and infrastructure.

35.5..IoT and Cyber-Physical Systems

Explore the role of the Internet of Things (IoT) as a component of CPS, focusing on its application in telecommunications.

35.6.Security and Privacy in CPS

Examine security challenges and privacy concerns in CPS, particularly how these affect telecommunication systems.

35.7.Real-time Data Processing and Analytics

Learn about the techniques and technologies used for real-time data processing and analytics in the context of CPS and telecommunications.

35.8.Machine Learning in Cyber-Physical Systems

Understand how machine learning can be applied to optimize and innovate CPS within tele----------communications.

35.9.Emerging Trends in CPS and Telecommunications

Discover the latest research and technological trends shaping the future of CPS in the telecom sector.

35.10.CPS Case Studies in Telecommunications

Analyze real-world case studies where CPS has been effectively integrated into telecommunications systems.

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35.3 Introduction to Cyber-Physical Systems

Understand the core concepts and significance of cyber-physical systems (CPS) in the modern world, particularly in the telecommunications industry.

Key Topics:

- **Core Concepts:** Basics of CPS and their importance in modern technology.
- **Significance:** Understanding why CPS are crucial in telecommunications.
- **Applications:** Various applications of CPS in different sectors.

35.4 Network Architecture in CPS

Study the architectural principles of integrating CPS with telecommunication networks, including topologies, network protocols, and infrastructure.

Key Topics:

- **Architectural Principles:** Fundamentals of network architecture in CPS.
- **Topologies:** Different types of network topologies used in CPS.
- **Network Protocols:** Understanding network protocols for CPS integration.
- **Infrastructure:** Building and managing CPS infrastructure in telecommunications.

35.5 IoT and Cyber-Physical Systems

Explore the role of the Internet of Things (IoT) as a component of CPS, focusing on its application in telecommunications.

Key Topics:

- **IoT Basics:** Understanding the fundamentals of IoT.
- **IoT in CPS:** How IoT devices integrate with CPS.
- **Applications in Telecommunications:** Using IoT for enhancing telecommunications systems.

35.6 Security and Privacy in CPS

Examine security challenges and privacy concerns in CPS, particularly how these affect telecommunication systems.

Key Topics:

- **Security Challenges:** Identifying and addressing security issues in CPS.
- **Privacy Concerns:** Ensuring data privacy in CPS applications.
- **Impact on Telecommunications:** Understanding how security and privacy issues affect telecom systems.

35.7 Real-time Data Processing and Analytics

Learn about the techniques and technologies used for real-time data processing and analytics in the context of CPS and telecommunications.

Key Topics:

- **Real-time Processing:** Techniques for real-time data processing in CPS.
- **Analytics:** Using analytics to gain insights from CPS data.
- **Technologies:** Tools and technologies for real-time data processing and analytics.

35.8 Machine Learning in Cyber-Physical Systems

Understand how machine learning can be applied to optimize and innovate CPS within telecommunications.

Key Topics:

- **Machine Learning Basics:** Introduction to machine learning concepts.
- **Applications in CPS:** How machine learning enhances CPS functionality.
- **Telecommunications:** Using machine learning for innovative solutions in telecom systems.

35.9 Emerging Trends in CPS and Telecommunications

Discover the latest research and technological trends shaping the future of CPS in the telecom sector.

Key Topics:

- **Research Developments:** Latest research in CPS and telecommunications.
- **Technological Trends:** Emerging technologies impacting CPS.
- **Future Prospects:** Predicting the future of CPS in the telecommunications industry.

35.10 CPS Case Studies in Telecommunications

Analyze real-world case studies where CPS has been effectively integrated into telecommunications systems.

Key Topics:

- **Case Studies:** Detailed analysis of successful CPS implementations.
- **Integration Strategies:** Understanding strategies for integrating CPS in telecom systems.
- **Lessons Learned:** Key takeaways from real-world CPS applications in telecommunications.

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38. Topics:

39. Master's Program in Artificial Intelligence and Machine Learning for Software Engineering

This course provides an in-depth exploration of artificial intelligence and machine learning within the context of software engineering. It is designed to equip students with the knowledge and practical skills required to implement AI/ML solutions efficiently within software applications. The course covers fundamental concepts, advanced techniques, and real-world applications of AI and ML, fostering the development and deployment of intelligent software systems.

36.1.Introduction to Artificial Intelligence and Machine Learning

This topic covers the fundamental concepts, history, and evolution of AI and ML, providing a basis for understanding how these technologies are poised to revolutionize software engineering.

36.2.Data Preprocessing and Feature Engineering

This module focuses on preparing data for machine learning models, involving data cleaning, normalization, and transformation. Feature engineering techniques are also discussed to improve model performance.

36.3.Supervised Learning Techniques

Discover various supervised learning algorithms such as regression, decision trees, and neural networks, and learn how to apply them within software systems.

36.4.Unsupervised Learning and Clustering

Explore unsupervised learning methods, including clustering and dimensionality reduction, which are essential for extracting insights from unlabeled data.

36.5.Deep Learning and Neural Networks

This topic delves into the structure and function of neural networks, focusing on deep learning techniques crucial for advancements in AI and complex software solutions.

36.6.Natural Language Processing

Gain an understanding of techniques to process and analyze human language data, facilitating the creation of AI-driven software that can comprehend and interact with text.

36.7.AI/ML in Software Development Lifecycle

Learn how AI and ML can be integrated into different stages of software development, from requirement gathering to deployment, enhancing software quality and performance.

36.8.Ethical and Responsible AI

Address the ethical considerations and responsibilities in AI, focusing on issues such as bias,

36.8.Deployment and Scaling of AI Solutions

Learn the practical considerations and challenges of deploying and scaling AI/ML solutions in production environments, ensuring they meet performance and reliability standards.

37.1 Master's Program in Artificial Intelligence and Machine Learning for Software Engineering

This course provides an in-depth exploration of artificial intelligence and machine learning within the context of software engineering. It is designed to equip students with the knowledge and practical skills required to implement AI/ML solutions efficiently within software applications. The course covers fundamental concepts, advanced techniques, and real-world applications of AI and ML, fostering the development and deployment of intelligent software systems.

37.2 Introduction to Artificial Intelligence and Machine Learning

This topic covers the fundamental concepts, history, and evolution of AI and ML, providing a basis for understanding how these technologies are poised to revolutionize software engineering.

Key Topics:

- **Fundamental Concepts:** Basics of AI and ML, including key definitions and principles.
- **History and Evolution:** Tracing the development of AI and ML over time.
- **Impact on Software Engineering:** Understanding how AI and ML are transforming the field of software engineering.

37.3 Data Preprocessing and Feature Engineering

This module focuses on preparing data for machine learning models, involving data cleaning, normalization, and transformation. Feature engineering techniques are also discussed to improve model performance.

Key Topics:

- **Data Cleaning:** Techniques for handling missing values, outliers, and inconsistencies in data.
- **Normalization and Transformation:** Methods for scaling and transforming data for better model performance.
- **Feature Engineering:** Creating and selecting relevant features to enhance model accuracy.

37.4 Supervised Learning Techniques

Discover various supervised learning algorithms such as regression, decision trees, and neural networks, and learn how to apply them within software systems.

Key Topics:

- **Regression:** Linear and logistic regression techniques.
- **Decision Trees:** Understanding how decision trees work and their applications.
- **Neural Networks:** Basics of neural networks and how they can be used in supervised learning.

37.5 Unsupervised Learning and Clustering

Explore unsupervised learning methods, including clustering and dimensionality reduction, which are essential for extracting insights from unlabeled data.

Key Topics:

- **Clustering:** Techniques such as K-means, hierarchical clustering, and DBSCAN.
- **Dimensionality Reduction:** Methods like PCA (Principal Component Analysis) and t-SNE.
- **Applications:** Real-world applications of unsupervised learning in software systems.

37.6 Deep Learning and Neural Networks

This topic delves into the structure and function of neural networks, focusing on deep learning techniques crucial for advancements in AI and complex software solutions.

Key Topics:

- **Deep Learning:** Understanding deep learning architectures like CNNs (Convolutional Neural Networks) and RNNs (Recurrent Neural Networks).

- **Neural Network Structures:** Layers, activation functions, and backpropagation.
- **Advanced Techniques:** Exploring advanced topics such as transfer learning and generative adversarial networks (GANs).

37.7 Natural Language Processing

Gain an understanding of techniques to process and analyze human language data, facilitating the creation of AI-driven software that can comprehend and interact with text.

Key Topics:

- **Text Preprocessing:** Techniques for tokenization, stemming, and lemmatization.
- **NLP Models:** Understanding models like Word2Vec, BERT, and GPT.
- **Applications:** Implementing NLP in chatbots, sentiment analysis, and other applications.

37.8 AI/ML in Software Development Lifecycle

Learn how AI and ML can be integrated into different stages of software development, from requirement gathering to deployment, enhancing software quality and performance.

Key Topics:

- **Requirement Gathering:** Using AI for requirement analysis and specification.
- **Development:** Incorporating AI/ML algorithms into software development processes.
- **Testing:** Automated testing and bug detection using AI.
- **Deployment:** Best practices for deploying AI/ML solutions in production environments.

37.9 Ethical and Responsible AI

Address the ethical considerations and responsibilities in AI, focusing on issues such as bias, transparency, and accountability.

Key Topics:

- **Bias and Fairness:** Identifying and mitigating biases in AI models.
- **Transparency:** Ensuring transparency in AI decision-making processes.
- **Accountability:** Establishing accountability for AI outcomes and decisions.

37.10 Deployment and Scaling of AI Solutions

Learn the practical considerations and challenges of deploying and scaling AI/ML solutions in production environments, ensuring they meet performance and reliability standards.

Key Topics:

- **Deployment Challenges:** Overcoming challenges in deploying AI solutions.
- **Scaling Techniques:** Techniques for scaling AI/ML models to handle large volumes of data.
- **Performance Monitoring:** Ensuring ongoing performance and reliability of AI solutions.

These courses provide a comprehensive understanding of artificial intelligence and machine learning for software engineering, equipping students with the knowledge and skills to innovate and lead in this rapidly evolving field

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37..Topics:

37.1.Advanced Studies in Autonomous Vehicles and Drones for Electric Vehicle Engineering

This course provides an in-depth exploration of the engineering principles and technological innovations driving autonomous vehicles and drones. Focused within the field of Electric Vehicle Engineering, the curriculum bridges the gap between hardware design, software development, and system integration to equip students with the skills to design, test, and refine autonomous systems.

37.1.Introduction to Autonomous Systems

An overview of autonomous vehicle and drone technologies, including historical development and future trends.

37.2Electric Vehicle Engineering Basics

Foundational concepts of electric vehicle engineering, including battery technology and electric motor design.

37.3.Sensor Technologies and Data Processing

Understanding the sensors used in autonomous systems, including LIDAR, RADAR, and cameras, as well as data processing algorithms.

37.4.Machine Learning and AI for Autonomous Systems

Exploration of machine learning and artificial intelligence applications in autonomous decision-making and navigation.

37.5.Communication Networks and IoT

Study of communication networks and the role of IoT in connecting autonomous vehicles and drones.

37.6.Control Systems for Autonomous Vehicles

Examination of control systems used for vehicle dynamics and operational management in autonomous vehicles.

37.7Ethical and Regulatory Aspects

Discussion on the ethical implications and regulatory challenges associated with the deployment of autonomous vehicles and drones.

37.8.Testing and Validation of Autonomous Systems

Processes involved in testing and validation methodologies to ensure the safety and reliability of autonomous systems.

37.9.Integration of Renewable Energy in Autonomous Systems

Integration of renewable energy sources like solar and wind power into autonomous systems to enhance sustainability.---

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37.1 Advanced Studies in Autonomous Vehicles and Drones for Electric Vehicle Engineering

This course provides an in-depth exploration of the engineering principles and technological innovations driving autonomous vehicles and drones. Focused within the field of Electric Vehicle Engineering, the curriculum bridges the gap between hardware design, software development, and system integration to equip students with the skills to design, test, and refine autonomous systems.

37.2 Introduction to Autonomous Systems

An overview of autonomous vehicle and drone technologies, including historical development and future trends.

Key Topics:

- **Historical Development:** Tracing the evolution of autonomous systems from inception to present day.
- **Technologies:** Key technologies driving autonomous vehicles and drones.
- **Future Trends:** Predicting the future advancements and trends in autonomous systems.

37.3 Electric Vehicle Engineering Basics

Foundational concepts of electric vehicle engineering, including battery technology and electric motor design.

Key Topics:

- **Battery Technology:** Understanding the types, design, and performance of batteries used in electric vehicles.
- **Electric Motor Design:** Basics of electric motor functionality and design.
- **Charging Systems:** Overview of charging infrastructure and technologies.

37.4 Sensor Technologies and Data Processing

Understanding the sensors used in autonomous systems, including LIDAR, RADAR, and cameras, as well as data processing algorithms.

Key Topics:

- **LIDAR and RADAR:** Functionality and applications in autonomous systems.
- **Cameras and Imaging:** Role of cameras in autonomous navigation and obstacle detection.
- **Data Processing Algorithms:** Techniques for processing and analyzing sensor data.

37.5 Machine Learning and AI for Autonomous Systems

Exploration of machine learning and artificial intelligence applications in autonomous decision-making and navigation.

Key Topics:

- **Machine Learning:** Applying ML algorithms for autonomous systems.
- **AI Decision-Making:** Implementing AI for navigation and obstacle avoidance.
- **Real-World Applications:** Case studies of AI and ML in autonomous vehicles and drones.

37.6 Communication Networks and IoT

Study of communication networks and the role of IoT in connecting autonomous vehicles and drones.

Key Topics:

- **Communication Protocols:** Understanding the protocols used in autonomous vehicle networks.
- **IoT Integration:** How IoT devices enhance connectivity in autonomous systems.
- **Network Security:** Ensuring secure communication in autonomous networks.

37.7 Control Systems for Autonomous Vehicles

Examination of control systems used for vehicle dynamics and operational management in autonomous vehicles.

Key Topics:

- **Vehicle Dynamics:** Basics of vehicle control and dynamics.
- **Control Algorithms:** Algorithms used for maintaining stability and control.
- **Operational Management:** Managing the operations of autonomous systems.

37.8 Ethical and Regulatory Aspects

Discussion on the ethical implications and regulatory challenges associated with the deployment of autonomous vehicles and drones.

Key Topics:

- **Ethical Considerations:** Addressing the ethical issues in autonomous system deployment.
- **Regulatory Frameworks:** Understanding the regulations governing autonomous vehicles and drones.
- **Compliance:** Ensuring compliance with legal and ethical standards.

37.9 Testing and Validation of Autonomous Systems

Processes involved in testing and validation methodologies to ensure the safety and reliability of autonomous systems.

Key Topics:

- **Testing Methodologies:** Techniques for testing autonomous systems.
- **Validation Processes:** Ensuring the reliability and safety of autonomous vehicles.
- **Case Studies:** Real-world examples of testing and validation.

37.10 Integration of Renewable Energy in Autonomous Systems

Investigating how renewable energy sources can be integrated into autonomous vehicles and drones to enhance sustainability.

Key Topics:

- **Renewable Energy Sources:** Types of renewable energy used in autonomous systems.
- **Integration Techniques:** Methods for integrating renewable energy into vehicle design.
- **Sustainability:** Promoting sustainable practices in autonomous vehicle engineering

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38.1.topics

38.2:Specialist Engineering in Infrastructure and Contractors: Electrochemical Engineering

This Master’s degree course offers in-depth knowledge in electrochemical engineering within the realm of infrastructure and contractors. It is designed to equip students with the fundamental theories and practical skills necessary to tackle complex engineering projects involving electrochemical systems. From battery technologies to electrochemical processes, students will explore various applications and innovative solutions pertinent to sustainable infrastructure.

38.3.Introduction to Electrochemical Engineering

Understand the basic principles of electrochemistry, including thermodynamics and kinetics, electron transfer processes, and the design and operation of electrochemical systems.

38.4.Battery Technologies for Infrastructure

Explore the various types of battery technologies used in infrastructure, including lithium-ion, lead-acid, and emerging technologies such as solid-state batteries.

38.5.Fuel Cells and Their Applications

Study the principles and applications of different types of fuel cells, focusing on their role in providing clean energy for infrastructure projects.

38.6.and Its Prevention

Learn about the electrochemical processes involved in corrosion, methods of prevention, and materials selection to enhance infrastructure durability.

38.7..Electrochemical Sensors and Monitoring

Understand the design and function of electrochemical sensors in monitoring environmental conditions and structural health in infrastructure projects.

38.8.Electrolysis and Industrial Processes

Explore how electrolysis is used in various industrial processes, such as water splitting for hydrogen production and metal plating.

38.9.Sustainability and Electrochemical Engineering

Discuss the impact of electrochemical engineering on sustainable infrastructure development and the environment.

.38.10.Advanced Topics in Electrochemical Engineering

Delve into advanced topics and current research trends in electrochemical engineering, such as nanostructured materials and next-generation energy systems.

38.2 Specialist Engineering in Infrastructure and Contractors: Electrochemical Engineering

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38.3 Introduction to Electrochemical Engineering

Understand the basic principles of electrochemistry, including thermodynamics and kinetics, electron transfer processes, and the design and operation of electrochemical systems.

Key Topics:

- **Thermodynamics and Kinetics:** Fundamental principles governing electrochemical reactions.
- **Electron Transfer Processes:** Mechanisms of electron transfer in electrochemical systems.
- **System Design and Operation:** Designing and operating efficient electrochemical systems.

38.4 Battery Technologies for Infrastructure

Explore the various types of battery technologies used in infrastructure, including lithium-ion, lead-acid, and emerging technologies such as solid-state batteries.

Key Topics:

- **Lithium-ion Batteries:** Structure, function, and applications.
- **Lead-acid Batteries:** Traditional uses and modern improvements.
- **Emerging Technologies:** Exploring the potential of solid-state and other advanced battery technologies.

38.5 Fuel Cells and Their Applications

Study the principles and applications of different types of fuel cells, focusing on their role in providing clean energy for infrastructure projects.

Key Topics:

- **Types of Fuel Cells:** Proton exchange membrane (PEM), solid oxide (SOFC), and others.
- **Clean Energy Production:** How fuel cells contribute to sustainable energy solutions.

- **Infrastructure Applications:** Real-world applications of fuel cells in infrastructure projects.

38.6 Corrosion and Its Prevention

Learn about the electrochemical processes involved in corrosion, methods of prevention, and materials selection to enhance infrastructure durability.

Key Topics:

- **Corrosion Mechanisms:** Understanding how and why corrosion occurs.
- **Prevention Methods:** Techniques to prevent and control corrosion.
- **Materials Selection:** Choosing materials to enhance durability and prevent corrosion.

38.7 Electrochemical Sensors and Monitoring

Understand the design and function of electrochemical sensors in monitoring environmental conditions and structural health in infrastructure projects.

Key Topics:

- **Sensor Design:** Principles of designing effective electrochemical sensors.
- **Environmental Monitoring:** Using sensors to monitor environmental conditions.
- **Structural Health Monitoring:** Applications in assessing the health and integrity of infrastructure.

38.8 Electrolysis and Industrial Processes

Explore how electrolysis is used in various industrial processes, such as water splitting for hydrogen production and metal plating.

Key Topics:

- **Electrolysis Basics:** Understanding the principles of electrolysis.

- **Hydrogen Production:** Using electrolysis for sustainable hydrogen generation.
- **Industrial Applications:** Applying electrolysis in metal plating and other industrial processes.

38.9 Sustainability and Electrochemical Engineering

Discuss the impact of electrochemical engineering on sustainable infrastructure development and the environment.

Key Topics:

- **Sustainability Principles:** Integrating sustainability into electrochemical engineering practices.
- **Environmental Impact:** Assessing and mitigating the environmental impact of electrochemical processes.
- **Sustainable Development:** Promoting sustainable infrastructure through innovative electrochemical solutions.

38.10 Advanced Topics in Electrochemical Engineering

Delve into advanced topics and current research trends in electrochemical engineering, such as nanostructured materials and next-generation energy systems.

Key Topics:

- **Nanostructured Materials:** Exploring the role of nanotechnology in electrochemical engineering.
- **Next-Generation Energy Systems:** Innovations in energy systems for sustainable infrastructure.
- **Current Research Trends:** Investigating the latest advancements and research in the field.

These courses provide a comprehensive understanding of electrochemical engineering in infrastructure and contractors, equipping students with the knowledge and skills to tackle complex engineering projects and promote sustainable developme

40.Topics

40.1Topics:Energy Storage and Battery Technology

This course explores advanced concepts in energy storage with a focus on battery technologies, essential for the integration of renewable energy sources. Students will gain an in-depth understanding of various energy storage systems, their applications, and the technological advancements driving the sector. The course is designed for graduate students in the Master's program in renewable energy, providing both theoretical knowledge and practical insights.

40.2.Introduction to Energy Storage Systems

An overview of energy storage technologies and their importance in the modern energy landscape.

40.3.Battery Chemistry and Physics

Understanding the fundamental principles of various battery chemistries, including lithium-ion, lead-acid, and emerging technologies.

40.4.Design and Functionality of Battery Cells

Exploration of the design and operational principles of individual battery cells, and how they combine to form larger battery systems.

40.5.Applications of Battery Storage

Examine how battery storage is used in various sectors such as electric vehicles, grid storage, and portable electronics.

40.6.Efficiency and Performance Measurements

Learn about the metrics used to measure the performance and efficiency of battery systems.

40.7.Safety and Environmental Impacts

Discussion of the safety protocols for batteries and their environmental impact, including recycling and waste management.

40.8.Advanced Energy Storage Technologies

Explore cutting-edge advancements in energy storage beyond current battery technology, such as supercapacitors and flow batteries.

40.9.Policy and Economics of Energy Storage

Examine the economic impacts, policy considerations, and market dynamics of implementing energy storage solutions.

40.10.Future Trends in Battery Technology

Insights into the future direction of battery technology research and its role in achieving a sustainable energy future.

41.1.Topics:

41.2.Advanced Robotic Process Automation in Electrical Engineering

This course aims to equip students with advanced knowledge and practical skills in implementing Robotic Process Automation (RPA) within the field of Electrical Engineering. The curriculum addresses the integration of RPA technologies to streamline and optimize engineering processes, focusing on automating complex electrical engineering tasks.

41.3.Introduction to Robotic Process Automation

An overview of RPA, its significance in the industry, and its application in electrical engineering.

41.4.RPA Tools and Technologies

Explore popular RPA tools like UiPath, Automation Anywhere, and Blue Prism and their specific applications in engineering.

41.5.Automating Electrical Design Processes

Learn how to automate repetitive tasks in electrical design using RPA to increase efficiency and reduce human error.

41.6.Data Migration and Management

Understanding the role of RPA in handling data migration and management in electrical engineering projects.

41.7.RPA in Control Systems

Applications of RPA in the automation of control systems and simulation processes within electrical engineering.

41.8.Machine Learning and RPA

Integrating machine learning with RPA for enhanced decision-making and predictive maintenance in electrical engineering.

41.9.RPA and IoT in Electrical Systems

Exploring the synergy between RPA and IoT to develop smart electrical systems with improved functionality and efficiency.

41.10.Security and Ethics in RPA

Understanding the ethical considerations and security challenges associated with the deployment of RPA in electrical engineering.

1.2 Advanced Robotic Process Automation in Electrical Engineering

This course aims to equip students with advanced knowledge and practical skills in implementing Robotic Process Automation (RPA) within the field of Electrical Engineering. The curriculum addresses the integration of RPA technologies to streamline and optimize engineering processes, focusing on automating complex electrical engineering tasks.

41.3 Introduction to Robotic Process Automation

An overview of RPA, its significance in the industry, and its application in electrical engineering.

Key Topics:

- **RPA Basics:** Understanding the fundamentals of Robotic Process Automation.
- **Industry Significance:** Exploring the importance and impact of RPA in various industries.
- **Applications in Electrical Engineering:** Specific use cases and benefits of RPA in electrical engineering.

41.4 RPA Tools and Technologies

Explore popular RPA tools like UiPath, Automation Anywhere, and Blue Prism and their specific applications in engineering.

Key Topics:

- **UiPath:** Features and applications of UiPath in automating engineering tasks.
- **Automation Anywhere:** Understanding how Automation Anywhere can be used in electrical engineering.
- **Blue Prism:** Exploring Blue Prism's capabilities and use cases in the industry.

41.5 Automating Electrical Design Processes

Learn how to automate repetitive tasks in electrical design using RPA to increase efficiency and reduce human error.

Key Topics:

- **Repetitive Task Automation:** Identifying and automating repetitive tasks in electrical design.
- **Efficiency Improvement:** Enhancing efficiency and productivity through automation.
- **Error Reduction:** Minimizing human errors by implementing RPA solutions.

41.6 Data Migration and Management

Understanding the role of RPA in handling data migration and management in electrical engineering projects.

Key Topics:

- **Data Migration:** Techniques for automating data migration processes.
- **Data Management:** Using RPA to manage and organize large datasets.
- **Project Applications:** Implementing RPA for data handling in engineering projects.

41.7 RPA in Control Systems

Applications of RPA in the automation of control systems and simulation processes within electrical engineering.

Key Topics:

- **Control Systems Automation:** Using RPA to automate control system processes.
- **Simulation Processes:** Enhancing simulation processes through automation.
- **Case Studies:** Real-world examples of RPA applications in control systems.

41.8 Machine Learning and RPA

Integrating machine learning with RPA for enhanced decision-making and predictive maintenance in electrical engineering.

Key Topics:

- **Machine Learning Integration:** Combining ML algorithms with RPA for advanced automation.
- **Predictive Maintenance:** Using ML and RPA for proactive maintenance strategies.
- **Enhanced Decision-Making:** Improving decision-making processes through intelligent automation.

41.9 RPA and IoT in Electrical Systems

Exploring the synergy between RPA and IoT to develop smart electrical systems with improved functionality and efficiency.

Key Topics:

- **RPA and IoT Integration:** Understanding how RPA and IoT can work together.
- **Smart Systems:** Developing smart electrical systems using RPA and IoT.

- **Efficiency and Functionality:** Enhancing system functionality and efficiency through integration.

41.10 Security and Ethics in RPA

Understanding the ethical considerations and security challenges associated with the deployment of RPA in electrical engineering.

Key Topics:

- **Ethical Considerations:** Addressing ethical issues in RPA implementation.
- **Security Challenges:** Identifying and mitigating security risks in RPA systems.
- **Best Practices:** Implementing best practices for secure and ethical RPA deployment.

These courses provide a comprehensive understanding of advanced robotic process automation in electrical engineering, equipping students with the knowledge and skills to innovate and lead in this field.

44…Topics grand circulum summarise resolve probme outcome exercise :

44.1 reating a comprehensive and accurate calculation formulation for a master's degree in electrical engineering typically involves several steps. These can vary depending on the specific topic or project you are working on. Here, I'll outline a general approach to developing a calculation formulation in the context of electrical engineering:

44..1. Define the Problem

- Clearly state the engineering problem or objective.
- Identify the variables and parameters involved.
- Determine the constraints and assumptions.

2. Develop the Mathematical Model

- Formulate the equations governing the physical system (e.g., Ohm's law, Kirchhoff's laws, Maxwell's equations).
- Use appropriate mathematical techniques to model the system (e.g., differential equations, linear algebra).

3. Simplify the Equations

- Apply any necessary simplifications or approximations.
- Reduce the equations to a solvable form.

4. Analytical Solution (if possible)

- Solve the equations analytically using mathematical methods.
- Check the validity of the analytical solution within the defined constraints.

5. Numerical Solution (if necessary)

- If the analytical solution is not feasible, develop a numerical solution.
- Use numerical methods (e.g., finite element method, numerical integration).

6. Simulation and Validation

- Implement the model in simulation software (e.g., MATLAB, Simulink).
- Validate the results with experimental data or known benchmarks.

7. Optimization (if applicable)

- Optimize the solution for desired performance criteria (e.g., efficiency, cost).
- Use optimization techniques (e.g., genetic algorithms, gradient descent).

Example Calculation: Load Flow Analysis in Power Systems

Here's a simplified example of a calculation formulation for load flow analysis in power systems:

Step 1: Define the Problem

- Objective: Determine the voltage and phase angle at each bus in the power system.
- Variables: Bus voltages (V), phase angles (θ), real power (P), reactive power (Q).
- Constraints: Power balance equations, voltage limits.

Step 2: Develop the Mathematical Model

- Use the power flow equations: $$P_i = V_i \sum_{j=1}^{n} V_j (G_{ij} \cos \theta_{ij} + B_{ij} \sin \theta_{ij})$$ $$Q_i = V_i \sum_{j=1}^{n} V_j (G_{ij} \sin \theta_{ij} - B_{ij} \cos \theta_{ij})$$ Where GijG_{ij} and BijB_{ij} are the conductance and susceptance of the transmission line between buses ii and jj.

Step 3: Simplify the Equations

- Apply any necessary assumptions (e.g., flat start method with initial voltage guesses).

Step 4: Analytical Solution

- Not feasible for large power systems.

Step 5: Numerical Solution

- Use the Newton-Raphson method to solve the power flow equations iteratively.

Step 6: Simulation and Validation

- Implement the Newton-Raphson method in MATLAB.
- Validate the results with a test power system.

Step 7: Optimization

- Optimize the power flow to minimize losses or improve voltage stability.

By following these steps, you can create a robust and accurate calculation formulation for various electrical engineering problems. If you need help with a specific calculation or further details on any step, feel free to ask!

Electrical engineering encompasses a wide range of topics that involve various calculations. Here are some common areas and the types of calculations typically associated with them:

1. Circuit Analysis

- **Ohm's Law:** V=IRV = IR
- **Power Calculations:** P=VIP = VI, P=I2RP = I^2R
- **Kirchhoff's Laws:** Kirchhoff's Voltage Law (KVL) and Kirchhoff's Current Law (KCL)
- **Impedance and Reactance:** Calculating the impedance (ZZ) of AC circuits, inductive reactance (XL=2πfLX_L = 2\pi fL), and capacitive reactance (XC=12πfCX_C = \frac{1}{2\pi fC})

2. Electromagnetics

- **Coulomb's Law:** F=keq1q2r2F = k_e \frac{q_1 q_2}{r^2}
- **Electric Field Calculations:** E=FqE = \frac{F}{q}
- **Magnetic Field Calculations:** Using Biot-Savart Law and Ampère's Law

3. Signal Processing

- **Fourier Transforms:** Transforming signals from time domain to frequency domain
- **Laplace Transforms:** For analyzing linear time-invariant systems
- **Z-Transforms:** Used in digital signal processing for discrete-time signals

4. Control Systems

- **Transfer Functions:** H(s)=Y(s)X(s)H(s) = \frac{Y(s)}{X(s)}
- **Stability Analysis:** Using Routh-Hurwitz criterion, Nyquist criterion, and Bode plots
- **PID Controller Tuning:** Calculations for proportional, integral, and derivative gains

5. Power Systems

- **Load Flow Analysis:** Solving the power flow equations using methods like Newton-Raphson or Gauss-Seidel
- **Short Circuit Calculations:** Determining the fault current levels in a power system
- **Power Factor Correction:** Calculations to improve the power factor of electrical loads

6. Electronics

- **Transistor Biasing:** Calculations for setting the operating point of transistors
- **Amplifier Design:** Gain and bandwidth calculations for different types of amplifiers
- **Oscillator Design:** Frequency and stability calculations for oscillators

7. Digital Systems

- **Logic Gates and Boolean Algebra:** Simplifying Boolean expressions
- **Flip-Flops and Counters:** Timing and state analysis
- **Digital Signal Processing:** Sampling, quantization, and digital filter design

8. Communication Systems

- **Modulation Techniques:** Calculations for AM, FM, and PM systems
- **Signal-to-Noise Ratio (SNR):** Calculating the quality of a signal
- **Bandwidth Calculations:** Determining the bandwidth requirements for various modulation schemes

9. Renewable Energy Systems

- **Solar Panel Calculations:** Determining the power output and efficiency of solar panels

- **Wind Turbine Calculations:** Analyzing the power generation capabilities of wind turbines

- **Battery Storage:** Calculations for energy storage capacity and efficiency

These topics and their associated calculations are fundamental to various fields within electrical engineering. If you need specific examples or more detailed explanations for any of these areas, feel free to ask!

1. Circuit Analysis

- **Ohm's Law and Power Calculations:** Used in designing electrical circuits for consumer electronics, industrial machinery, and power distribution systems. Engineers calculate the appropriate resistance, current, and voltage to ensure safe and efficient operation.

- **Kirchhoff's Laws:** Applied in the design and troubleshooting of complex electrical networks, such as those in automotive systems and aerospace engineering. These laws help ensure that all electrical parameters are balanced and within safe limits.

2. Electromagnetics

- **Magnetic Field Calculations:** Utilized in the design of electric motors, transformers, and inductors. These calculations help engineers optimize the magnetic field strength and minimize energy losses.

- **Antenna Design:** Engineers use electromagnetic theory to design antennas for telecommunications, including mobile phones, satellite communication, and radar systems, ensuring optimal signal strength and coverage.

3. Signal Processing

- **Fourier Transforms:** Employed in the analysis and design of communication systems, such as modems, to convert signals between time and frequency domains. This is crucial for filtering, modulation, and noise reduction.

- **Digital Signal Processing (DSP):** Used in audio and image processing applications, including noise cancellation in headphones, speech recognition systems, and medical imaging devices.

4. Control Systems

- **Stability Analysis:** Applied in the design of control systems for various applications, such as robotics, automotive cruise control, and industrial automation. Engineers ensure that the system remains stable under different operating conditions.

- **PID Controller Tuning:** Essential for maintaining precise control in processes like temperature regulation in HVAC systems, speed control in electric motors, and pressure control in chemical plants.

5. Power Systems

- **Load Flow Analysis:** Critical for the planning and operation of electrical power grids. Engineers use load flow studies to determine the best configuration of the network to ensure reliable power delivery and minimize losses.

- **Short Circuit Calculations:** Used to design protective devices like circuit breakers and fuses, ensuring the safety of power systems during fault conditions.

6. Electronics

- **Transistor Biasing:** Ensures that transistors operate correctly within amplifiers and switching circuits. This is vital in designing everything from audio amplifiers to digital logic circuits.

- **Amplifier Design:** Calculations help determine the gain, bandwidth, and stability of amplifiers used in audio equipment, communication systems, and medical devices.

7. Digital Systems

- **Logic Gates and Boolean Algebra:** Fundamental in the design of digital circuits and microprocessors. Engineers use these calculations to create efficient and reliable digital systems for computers, smartphones, and embedded systems.

- **Flip-Flops and Counters:** Used in the design of memory elements and timing circuits, essential for data storage and processing in digital electronics.

8. Communication Systems

- **Modulation Techniques:** Applied in the design of wireless communication systems, such as radio, television, and mobile networks. Engineers calculate modulation parameters to ensure efficient and clear transmission of signals.

- **Bandwidth Calculations:** Determine the required bandwidth for different communication channels, ensuring optimal use of the frequency spectrum.

9. Renewable Energy Systems

- **Solar Panel Calculations:** Used to design and optimize solar power systems for residential, commercial, and utility-scale applications. Engineers calculate the number of panels, their orientation, and energy output.

- **Wind Turbine Calculations:** Help determine the optimal placement, size, and design of wind turbines to maximize energy production and minimize environmental impact.

These calculations are fundamental to ensuring that electrical engineering projects are efficient, safe, and reliable. They enable engineers to innovate and develop solutions that meet the needs of modern society. If you have any specific area or project in mind, I can provide more detailed examples of how calculations are applied!

. Circuit Design and Analysis

- **Consumer Electronics:** Engineers use Ohm's Law, Kirchhoff's Laws, and power calculations to design and analyze circuits in devices like smartphones, laptops, and home appliances. These calculations ensure that the circuits function correctly and safely.

- **Automotive Electronics:** In automotive engineering, circuit analysis ensures that electronic control units (ECUs) and other electronic components operate reliably, improving vehicle safety and performance.

2. Power Systems Engineering

- **Power Grid Management:** Load flow analysis is used to plan and operate electrical power grids, ensuring efficient power distribution and stability. Engineers use this to design new power plants and optimize the existing grid to handle varying load demands.

- **Renewable Energy Integration:** Short circuit calculations and power factor correction are crucial when integrating renewable energy sources like solar panels and wind turbines into the power grid. These calculations ensure that the system can handle new power sources without compromising stability.

3. Control Systems

- **Industrial Automation:** Engineers apply control system calculations to design and optimize automated manufacturing processes. For example, PID controllers are used to regulate temperature, pressure, and other variables in chemical plants and manufacturing lines.

- **Robotics:** Control systems calculations are essential for designing and tuning the control algorithms that allow robots to perform precise movements and tasks, such as assembly line work or medical surgeries.

4. Communication Systems

- **Telecommunications:** Engineers use modulation and bandwidth calculations to design and optimize communication systems, ensuring clear and efficient signal transmission. This is essential for mobile networks, satellite communications, and internet services.

- **Signal Processing:** Fourier transforms and digital signal processing (DSP) techniques are used to filter and enhance audio and video signals in applications like broadcasting, video conferencing, and speech recognition.

5. Electronics and Semiconductor Design

- **Integrated Circuit Design:** Engineers use transistor biasing and amplifier design calculations to develop integrated circuits (ICs) used in various electronic devices. These calculations ensure that ICs operate efficiently and reliably.

- **Sensor Development:** Calculations related to impedance and reactance are used in designing sensors for applications like medical devices, environmental monitoring, and industrial automation.

6. Renewable Energy Systems

- **Solar Power Systems:** Engineers perform solar panel calculations to design and optimize solar power installations, ensuring maximum

energy generation and efficiency. This includes determining the optimal tilt angle, orientation, and panel configuration.

- **Wind Energy Projects:** Wind turbine calculations help determine the best locations, sizes, and designs for wind turbines to maximize energy production and minimize environmental impact.

7. Building and Infrastructure

- **Smart Buildings:** Engineers use IoT and control systems calculations to design smart building systems that optimize energy usage, enhance security, and improve occupant comfort. This includes designing HVAC systems, lighting controls, and security systems.

- **Transportation Infrastructure:** Calculations related to power distribution, signal processing, and control systems are used in designing and maintaining transportation infrastructure like railways, airports, and traffic management systems.

8. Biomedical Engineering

- **Medical Devices:** Engineers use signal processing and control system calculations to develop medical devices such as MRI machines, pacemakers, and automated insulin pumps. These calculations ensure accurate and reliable operation of medical equipment.

- **Wearable Technology:** Calculations for power efficiency and signal processing are essential in designing wearable health monitoring devices that track vital signs and provide real-time health data.

These examples highlight the critical role of electrical engineering calculations in ensuring the efficiency, safety, and reliability of various systems and technologies in real-world engineering projects. If you have a specific project or area in mind, I can provide more detailed examples or explanations.

To resolve calculations related to a Master's program in Electrical Engineering with a focus on communication and information systems, we can look at some common topics and the typical calculations involved in those areas. Here's a breakdown:

1. Signal Processing

- **Fourier Transforms and Spectral Analysis**

- Calculate the Fourier transform X(f)X(f) of a time-domain signal x(t)x(t): $$X(f) = \int_{-\infty}^{\infty} x(t)e^{-j2\pi ft} dt$$
- Use spectral analysis to identify frequency components and bandwidth.

- **Filter Design**
  - Design digital filters using the Z-transform and filter specifications (e.g., cutoff frequency, filter order): $$H(z) = \frac{b_0 + b_1z^{-1} + \cdots + b_Mz^{-M}}{1 + a_1z^{-1} + \cdots + a_Nz^{-N}}$$
  - Analyze filter response and stability.

2. Communication Systems

- **Modulation and Demodulation**
  - Calculate modulation index mm for amplitude modulation (AM): $$m = \frac{A_m}{A_c}$$ where AmA_m is the amplitude of the message signal and AcA_c is the amplitude of the carrier signal.
  - Determine the bandwidth of frequency-modulated (FM) signals using Carson's rule: $$BW = 2(\Delta f + f_m)$$ where Δf\Delta f is the frequency deviation and fmf_m is the maximum modulating frequency.

- **Signal-to-Noise Ratio (SNR)**
  - Calculate the SNR for a communication system: $$\text{SNR} = 10 \log_{10}\left(\frac{P_{signal}}{P_{noise}}\right)$$ where PsignalP_{signal} is the power of the signal and PnoiseP_{noise} is the power of the noise.

3. Information Theory

- **Entropy and Information Content**
  - Calculate the entropy H(X)H(X) of a discrete random variable XX: $$H(X) = -\sum_{i} P(x_i) \log_2 P(x_i)$$ where P(xi)P(x_i) is the probability of the ii-th outcome.

- **Channel Capacity**

- Determine the channel capacity CC using the Shannon-Hartley theorem: $$C = B \log_2 \left(1 + \frac{S}{N}\right)$$ where BB is the bandwidth of the channel, SS is the signal power, and NN is the noise power.

4. Network Theory

- **Network Topologies and Protocols**
  - Analyze network performance metrics such as latency, throughput, and packet loss for different topologies (e.g., star, mesh).
  - Use queuing theory to model and evaluate network performance.

5. Electromagnetic Theory

- **Maxwell's Equations**
  - Apply Maxwell's equations to solve for electric and magnetic fields in communication systems: $$\nabla \cdot \mathbf{E} = \frac{\rho}{\epsilon_0}$$ $$\nabla \cdot \mathbf{B} = 0$$ $$\nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t}$$ $$\nabla \times \mathbf{B} = \mu_0 \mathbf{J} + \mu_0 \epsilon_0 \frac{\partial \mathbf{E}}{\partial t}$$

6. Digital Communication

- **Error Detection and Correction**
  - Calculate the Hamming distance and error-detecting/correcting capabilities of codes.
  - Use cyclic redundancy check (CRC) to detect errors in transmitted dat

1. Signal Processing

- **Fourier Transforms and Spectral Analysis:**
  - Used to convert time-domain signals to frequency-domain representations for analyzing and filtering signals. For example, Fourier transforms are used in OFDM (Orthogonal Frequency

Division Multiplexing) systems in 4G and 5G networks to enable efficient data transmission.

- **Filter Design:**
    - Digital filters are designed using Z-transforms to remove noise and interference from signals. This is crucial in audio and video streaming services to ensure clear and high-quality transmission.

2. Communication Systems

- **Modulation and Demodulation:**
    - Modulation techniques like QAM (Quadrature Amplitude Modulation) and PSK (Phase Shift Keying) are used in transmitting data over various communication channels. Calculations for modulation index and bandwidth are critical in maximizing data rates while minimizing interference.
- **Signal-to-Noise Ratio (SNR):**
    - SNR calculations are used to assess the quality of received signals. High SNR is essential for maintaining clear communication in wireless networks, satellite communications, and broadcasting.

3. Information Theory

- **Entropy and Information Content:**
    - Calculations of entropy help in designing efficient coding schemes, such as Huffman coding and Shannon-Fano coding, which are used in data compression algorithms to reduce the amount of data transmitted.
- **Channel Capacity:**
    - Determining the channel capacity helps in optimizing the usage of available bandwidth. This is vital in designing systems like DSL (Digital Subscriber Line) and fiber-optic communication to achieve high data rates.

4. Network Theory

- **Network Topologies and Protocols:**
    - Performance metrics such as latency, throughput, and packet loss are calculated to design and optimize network topologies. For example, in Wi-Fi networks, these metrics ensure efficient data transmission and minimal delays.

5. Electromagnetic Theory

- **Maxwell's Equations:**
    - Applied to design and analyze antennas and propagation models in wireless communication. Engineers use these calculations to ensure optimal signal strength and coverage in cellular networks, GPS, and satellite communications.

6. Digital Communication

- **Error Detection and Correction:**
    - Error-detecting and correcting codes like Hamming codes and Reed-Solomon codes are calculated and implemented to ensure data integrity during transmission. These are widely used in storage devices, CDs/DVDs, and data transmission systems.

Practical Examples:

Mobile Networks (4G/5G)

- **OFDM:** Fourier transforms are used to split data into multiple frequency bands, allowing simultaneous data transmission and improving spectral efficiency.
- **MIMO (Multiple Input Multiple Output):** SNR and channel capacity calculations optimize the use of multiple antennas, enhancing data rates and signal quality.

Satellite Communication

- **Link Budget Analysis:** Calculations for SNR, modulation schemes, and error correction ensure reliable communication links between satellites and ground stations.
- **Doppler Shift Compensation:** Calculations are used to adjust for frequency shifts due to the relative motion of satellites and receivers.

Optical Fiber Communication

- **Wavelength-Division Multiplexing (WDM):** Spectral analysis ensures multiple data streams are transmitted simultaneously over different wavelengths, maximizing bandwidth.
- **Dispersion Management:** Calculations for dispersion compensate for signal spreading in the fiber, maintaining signal integrity over long distances.

IoT (Internet of Things)

- **Power Efficiency Calculations:** Ensuring low power consumption in IoT devices through efficient modulation schemes and data transmission protocols.
- **Network Scaling:** Calculations for network capacity and data flow ensure seamless connectivity and communication between a large number of IoT devices.

These calculations are vital for the successful implementation and optimization of modern communication systems, enabling high-speed, reliable, and efficient communication across various platforms and technologies. If you have a specific communication system or technology in mind, I can provide more detailed examples of how calculations are applied.

Solar Power Systems

Calculations for designing and optimizing solar power installations:

1. Solar Panel Output Calculation

- **Formula:** $$ P = A \times G \times \eta $$ Where:
  - PP is the power output (Watts)
  - AA is the area of the solar panel (square meters)
  - GG is the solar irradiance (Watts per square meter)
  - η\eta is the efficiency of the solar panel

2. Optimal Tilt Angle Calculation

- **Formula:**

- For fixed solar panels: $$ \theta_{opt} = \text{Latitude} \pm 15^\circ $$
- Adjust based on seasonal changes:
  - **Winter:** θopt=Latitude+15∘\theta_{opt} = \text{Latitude} + 15^\circ
  - **Summer:** θopt=Latitude−15∘\theta_{opt} = \text{Latitude} - 15^\circ

3. Orientation Calculation

- **Formula:**
  - The optimal orientation for solar panels in the Northern Hemisphere is true south, while in the Southern Hemisphere, it is true north.
  - **Azimuth Angle:** $$ \gamma = 180^\circ \text{ (South) or } 0^\circ \text{ (North)} $$
  - Adjustments might be necessary depending on local shading and obstacles.

4. Panel Configuration Calculation

- **Series and Parallel Connections:**
  - **Series:** Voltage adds up, current remains the same. $$ V_{total} = \sum_{i=1}^{n} V_i $$
  - **Parallel:** Current adds up, voltage remains the same. $$ I_{total} = \sum_{i=1}^{n} I_i $$

Wind Energy Projects

Calculations for optimizing wind turbine installations:

1. Power Output Calculation

- **Formula:** $$ P = \frac{1}{2} \rho A v^3 \eta $$ Where:
  - PP is the power output (Watts)
  - ρ\rho is the air density (kg/m³)

- AA is the swept area of the turbine blades (m^2)
- vv is the wind speed (m/s)
- η\eta is the efficiency of the turbine

2. Optimal Location Calculation

- **Formula:**
  - **Capacity Factor:** Average power generated divided by the rated peak power. $$ \text{Capacity Factor} = \frac{\text{Average Power Output}}{\text{Rated Peak Power}} $$
  - Areas with higher average wind speeds are preferred. Use wind resource maps and data.

3. Turbine Size and Design Calculation

- **Formula:**
  - **Rotor Diameter:** $$ D = 2 \sqrt{\frac{A}{\pi}} $$
  - Where DD is the rotor diameter and AA is the swept area.

4. Environmental Impact Calculation

- **Formula:**
  - **Noise Level:** Calculate expected noise levels at various distances. $$ L = L_0 - 20 \log_{10}(d) $$
  - Where LL is the noise level at distance dd from the source, and L0L_0 is the noise level at the reference distance.

These calculations are integral to ensuring that renewable energy systems are both efficient and environmentally friendly. If

1. Fourier Transforms and Spectral Analysis

Fourier transforms are crucial for converting time-domain signals to frequency-domain representations. This is essential for analyzing and filtering signals, particularly in applications like OFDM (Orthogonal Frequency Division Multiplexing) used in 4G and 5G networks.

Fourier Transform:

- **Definition:** $$ X(f) = \int_{-\infty}^{\infty} x(t) e^{-j2\pi ft} dt $$ Where:
    - X(f)X(f) is the frequency-domain representation of the signal.
    - x(t)x(t) is the time-domain signal.
    - jj is the imaginary unit.
    - ff is the frequency.
- **Inverse Fourier Transform:** $$ x(t) = \int_{-\infty}^{\infty} X(f) e^{j2\pi ft} df $$

Example - OFDM:

- In OFDM, multiple carriers are modulated with the data stream, and Fourier transforms are used to multiplex and demultiplex the carriers efficiently.
- **Calculations:** Transform the data from the time domain to the frequency domain before transmission and back to the time domain upon reception, using the FFT (Fast Fourier Transform) algorithm.

2. Filter Design

Digital filters are designed using Z-transforms to remove noise and interference from signals, ensuring clear and high-quality transmission in audio and video streaming services.

Z-Transform:

- **Definition:** $$ H(z) = \frac{Y(z)}{X(z)} $$ Where:
    - H(z)H(z) is the transfer function of the digital filter.
    - Y(z)Y(z) is the Z-transform of the output signal.
    - X(z)X(z) is the Z-transform of the input signal.

Example - FIR Filter:

- **FIR (Finite Impulse Response) Filter Design:** $$ H(z) = \sum_{k=0}^{N-1} h[k] z^{-k} $$ Where h[k]h[k] are the filter coefficients.
- **Design Steps:**
    1. Specify the desired frequency response.
    2. Determine the filter order NN.
    3. Calculate the filter coefficients h[k]h[k].

Communication Systems Calculations

Modulation and Demodulation

Modulation techniques like QAM (Quadrature Amplitude Modulation) and PSK (Phase Shift Keying) are used to transmit data over communication channels efficiently.

Quadrature Amplitude Modulation (QAM):

- **Formula:** $$ s(t) = I(t) \cos(2 \pi f_c t) - Q(t) \sin(2 \pi f_c t) $$ Where:
    - I(t)I(t) and Q(t)Q(t) are the in-phase and quadrature components of the signal.
    - fcf_c is the carrier frequency.

Phase Shift Keying (PSK):

- **Formula:** $$ s(t) = \cos(2 \pi f_c t + \theta) $$ Where:
    - θ\theta is the phase shift representing the data.

Example - QAM Modulation:

- **Steps:**
    1. Map the input data to QAM symbols.
    2. Generate the modulated signal using the QAM formula.

Example - PSK Modulation:

- **Steps:**
    1. Map the input data to phase shifts.
    2. Generate the modulated signal using the PSK form

1. MIMO (Multiple Input Multiple Output) Systems

SNR (Signal-to-Noise Ratio) Calculation:

- **Definition:** SNR is the ratio of the power of the signal to the power of the background noise.
- **Formula:** $$ \text{SNR} = \frac{P_{signal}}{P_{noise}} $$
    - In decibels (dB): $$ \text{SNR}*{dB} = 10 \log*{10}\left(\ frac{P_{signal}}{P_{noise}}\right) $$

Channel Capacity Calculation:

- **Shannon-Hartley Theorem:** $$ C = M \cdot B \cdot \log_2 (1 + \ text{SNR}) $$ Where:
    - CC is the channel capacity (bps)
    - MM is the number of antennas
    - BB is the bandwidth (Hz)
    - SNR\text{SNR} is the Signal-to-Noise Ratio

2. Satellite Communication

Link Budget Analysis:

- **Definition:** A link budget accounts for all gains and losses from the transmitter, through the medium, to the receiver in a telecommunication system.
- **Formula:** $$ P_{r} = P_{t} + G_{t} + G_{r} - L_{p} - L_{s} - L_{m} $$ Where:
    - PrP_{r} is the received power (dBm)

- PtP_{t} is the transmitted power (dBm)
- GtG_{t} is the transmitter antenna gain (dBi)
- GrG_{r} is the receiver antenna gain (dBi)
- LpL_{p} is the free-space path loss (dB)
- LsL_{s} is the system losses (dB)
- LmL_{m} is the miscellaneous losses (dB)

Doppler Shift Compensation:

- **Definition:** Doppler shift is the change in frequency of a wave in relation to an observer moving relative to the source of the wave.
- **Formula:** $$ f_d = \frac{v}{c} f_s $$ Where:
  - fdf_d is the Doppler shift
  - vv is the relative velocity between the source and observer
  - cc is the speed of light
  - fsf_s is the source frequency

3. Optical Fiber Communication

Wavelength-Division Multiplexing (WDM):

- **Spectral Analysis:**
  - **Fourier Transform:** $$ X(f) = \int_{-\infty}^{\infty} x(t) e^{-j2\pi ft} dt $$

Dispersion Management:

- **Definition:** Dispersion in optical fibers causes pulse spreading, reducing signal quality over long distances.
- **Formula:** $$ D = \frac{d\tau}{d\lambda} = \frac{d^{2\beta}{d\lambda^2} $$ Where:
  - DD is the dispersion parameter

- τ\tau is the pulse broadening
- λ\lambda is the wavelength
- β\beta is the propagation constant

4. IoT (Internet of Things)

Power Efficiency Calculations:

- **Definition:** Ensuring low power consumption in IoT devices.
- **Formula:**
  - **Energy Consumption:** $$ E = P \times t $$ Where:
  - EE is the energy consumption
  - PP is the power consumption
  - tt is the time

Network Scaling:

- **Definition:** Ensuring the network can scale efficiently with the addition of new devices.
- **Formula:**
  - **Network Capacity:** $$ C = B \cdot \log_2 (1 + \text{SNR}) $$ Where:
  - CC is the capacity
  - BB is the bandwidth
  - SNR\text{SNR} is the Signal-to-Noise Ratio

Communication technology has evolved significantly over centuries, transforming how we share information and connect with each other. Here are some key historical milestones:

Ancient Times

- **100,000 BC:** Development of human speech, enabling verbal communication

Integral Derivation in Thermodynamics:

- **Gibbs Free Energy (**ΔG\Delta G**) Calculation:**
    - Formula for the Gibbs free energy change: $$ \Delta G = \Delta H - T \Delta S $$ Where:
        - ΔH\Delta H is the enthalpy change
        - TT is the temperature (in Kelvin)
        - ΔS\Delta S is the entropy change
- **Nernst Equation:**
    - Used to calculate the cell potential under non-standard conditions: $$ E = E^\circ - \frac{RT}{nF} \ln Q $$ Where:
        - EE is the cell potential
        - E∘E^\circ is the standard cell potential
        - RR is the universal gas constant
        - TT is the temperature (in Kelvin)
        - nn is the number of moles of electrons
        - FF is Faraday's constant
        - QQ is the reaction quotient

Kinetics and Electron Transfer Processes:

- **Rate of Reaction:**
    - Formula for the rate of an electrochemical reaction: $$ \text{Rate} = k[A]^{m[B]}n $$ Where:
        - kk is the rate constant
        - [A][A] and [B][B] are the concentrations of reactants

        - mm and nn are the reaction orders

- **Butler-Volmer Equation:**
    - Describes the current density as a function of overpotential: $$ j = j_0 \left(\exp \left(\frac{\alpha n F \eta}{RT} \right) - \exp \left(-\frac{(1-\alpha) n F \eta}{RT} \right) \right) $$ Where:
        - jj is the current density
        - j0j_0 is the exchange current density
        - α\alpha is the charge transfer coefficient
        - η\eta is the overpotential

System Design and Operation

- **Electrochemical Cell Design:**
    - **Anode and Cathode Selection:** Choosing appropriate materials for the anode and cathode based on their electrochemical properties.
    - **Electrolyte:** Selecting the right electrolyte to ensure efficient ion transport and minimal resistance.
    - **Configuration:** Designing the cell layout to optimize performance, durability, and safety.
- **Operational Parameters:**
    - **Temperature Control:** Ensuring the system operates within the optimal temperature range for maximum efficiency.
    - **Current Density:** Regulating the current density to balance between reaction rate and energy efficiency.
    - **Maintenance:** Implementing regular maintenance protocols to ensure the longevity and reliability of the system.

Battery Technologies for Infrastructure

Lithium-ion Batteries:

- **Structure:**
    - Composed of a positive electrode (cathode), a negative electrode (anode), and an electrolyte that allows for ion transport.
- **Function:**
    - During discharge, lithium ions move from the anode to the cathode through the electrolyte, releasing energy.
- **Applications:**
    - Widely used in portable electronics, electric vehicles, and grid energy storage due to their high energy density and long cycle life.

Lead-acid Batteries:

- **Traditional Uses:**
    - Commonly used in automotive applications for starting, lighting, and ignition (SLI) due to their reliability and cost-effectiveness.
- **Modern Improvements:**
    - Enhanced designs for better performance, such as AGM (Absorbent Glass Mat) and gel batteries, which offer improved safety and efficiency.

Emerging Technologies:

- **Solid-state Batteries:**
    - Use a solid electrolyte instead of a liquid one, offering higher energy density, improved safety, and longer life cycles.
- **Other Advanced Technologies:**
    - Exploring batteries like lithium-sulfur, lithium-air, and flow batteries for specific applications requiring high energy capacity and efficien

34.6 Performance Benefits of Immutable Data

Investigating the performance benefits that immutable data can bring to web applications and how these benefits can be maximized.

Performance Improvements

Understanding how immutable data can enhance performance:

3. **Reduced Unnecessary Re-renders:**
    - **Explanation:** In web applications, especially those using frameworks like React, immutable data structures can help optimize re-rendering processes. By ensuring data is unchanged, the application can more efficiently determine when to re-render components.
    - **Calculation:** Suppose O(n)O(n) is the complexity for checking if data has changed.
        - **Mutable Data:** Every change requires a deep comparison, leading to higher computational costs.
        - **Immutable Data:** Directly comparing references, leading to O(1)O(1) complexity for detecting changes, reducing overhead.
4. **Improved Debugging and Testing:**
    - **Explanation:** Immutable data structures can make debugging and testing easier because the data state is predictable and stable, leading to fewer side effects.
    - **Calculation:** Less time spent on debugging and fewer bugs introduced due to unexpected data mutations.

Optimization Techniques

Techniques for maximizing the performance benefits of immutable data:

2. **Use of Libraries:**
    - **Immutable.js:** A library providing persistent immutable data structures.
        - **Example:**

javascript

38.7 Electrochemical Sensors and Monitoring

Integral and Derivative Calculations in Electrochemical Sensors

Design and Function:

Electrochemical sensors are designed to detect and measure specific chemical compounds by generating an electrical signal that is proportional to the concentration of the compound of interest. These sensors are commonly used for monitoring environmental conditions and assessing the structural health of infrastructure.

Integral Calculations:

- **Signal Integration:**
    - To measure the total amount of analyte over time, integration of the sensor signal I(t)I(t) is performed: $$ Q = \int_0^T I(t) \, dt $$
    - Where QQ is the total charge, I(t)I(t) is the current as a function of time, and TT is the total time period.

Derivative Calculations:

- **Rate of Change:**
    - To assess the rate of change of the analyte concentration, the derivative of the sensor signal can be calculated: $$ \frac{dC}{dt} = k \frac{dI}{dt} $$
    - Where CC is the concentration, II is the current, and kk is a constant.

38.8 Electrolysis and Industrial Processes

Integral and Derivative Calculations in Electrolysis

Water Splitting for Hydrogen Production:

- **Integral Calculations:**
    - **Total Hydrogen Production:** $$ H_2 (g) = \int_0^T \left(\frac{I(t)}{2F} \right) dt $$
        - Where H2H_2 is the amount of hydrogen gas produced, I(t)I(t) is the current as a function of time, FF is Faraday's constant, and TT is the total time.
- **Derivative Calculations:**
    - **Current Density:** $$ J = \frac{dI}{dA} $$
        - Where JJ is the current density, II is the current, and AA is the electrode area.

Metal Plating:

- **Integral Calculations:**
    - **Total Metal Deposited:** $$ M = \int_0^T \left(\frac{I(t) \cdot M}{nF} \right) dt $$
        - Where MM is the mass of the metal deposited, I(t)I(t) is the current as a function of time, nn is the number of electrons involved in the reaction, FF is Faraday's constant, and TT is the total time.
- **Derivative Calculations:**
    - **Rate of Deposition:** $$ \frac{dM}{dt} = \frac{I(t) \cdot M}{nF} $$
        - Where dM/dtdM/dt is the rate of metal deposition.

38.9 Sustainability and Electrochemical Engineering

Impact on Sustainable Infrastructure Development

Energy Efficiency:

- **Integral Calculations:**
    - **Energy Consumption:** $$ E = \int_0^T P(t) \, dt $$

        - Where EE is the total energy consumption, P(t)P(t) is the power consumption as a function of time, and TT is the total time period.

Resource Recovery:

- **Integral Calculations:**
    - **Recovered Resources:** $$ R = \int_0^T r(t) \, dt $$
        - Where RR is the total amount of resources recovered, r(t)r(t) is the recovery rate as a function of time, and TT is the total time period.

Environmental Impact:

- **Derivative Calculations:**
    - **Rate of Emission Reduction:** $$ \frac{dE_r}{dt} = f(t) $$
        - Where ErE_r is the emission reduction, and f(t)f(t) is a function representing the rate of emission reduction over tim

5. Automating Electrical Design Processes

Key Topics:

- **Repetitive Task Automation:** Identifying and automating repetitive tasks in electrical design.
- **Efficiency Improvement:** Enhancing efficiency and productivity through automation.
- **Error Reduction:** Minimizing human errors.

Integral and Derivative Calculations in Automating Electrical Design Processes

Repetitive Task Automation

Identifying and Automating Repetitive Tasks:

- **Integral Calculations:**
    - **Total Time Spent on Repetitive Tasks:** $$ T = \int_0^N t_i \, di $$
        - Where TT is the total time, tit_i is the time spent on each task, and NN is the total number of tasks.
- **Derivative Calculations:**
    - **Rate of Task Completion:** $$ \frac{dT}{dt} = \text{Rate of Task Completion} $$
        - Where TT is the number of tasks and tt is the time.

Example:

- Identifying tasks such as circuit simulations, schematic updates, and documentation that can be automated using Robotic Process Automation (RPA) tools like UiPath or Automation Anywhere.

Efficiency Improvement

Enhancing Efficiency and Productivity through Automation:

- **Integral Calculations:**
    - **Total Efficiency Gain:** $$ E = \int_0^T \frac{P_a - P_m}{P_m} \, dt $$
        - Where EE is the efficiency gain, PaP_a is the productivity with automation, PmP_m is the productivity without automation, and TT is the total time.
- **Derivative Calculations:**
    - **Rate of Efficiency Improvement:** $$ \frac{dE}{dt} = \text{Rate of Efficiency Improvement} $$
        - Where EE is the efficiency and tt is the time.

Example:

- Automating tasks such as generating Bill of Materials (BOM), performing simulations, and generating design reports to save time and reduce manual effort.

Error Reduction

Minimizing Human Errors:

- **Integral Calculations:**
    - **Total Errors Before and After Automation:** $$ E_{\text{total}} = \int_0^N e_{\text{manual}} \, di - \int_0^N e_{\text{automated}} \, di $$
        - Where EtotalE_{\text{total}} is the total error reduction, emanuale_{\text{manual}} is the error rate with manual processes, eautomatede_{\text{automated}} is the error rate with automated processes, and NN is the total number of tasks.
- **Derivative Calculations:**
    - **Rate of Error Reduction:** $$ \frac{dE_r}{dt} = \text{Rate of Error Reduction} $$
        - Where ErE_r is the error reduction and tt is the time.

Project Management in Electrical Engineering

Principles and practices of effective project management tailored to electrical engineering projects and infrastructure.

Key Topics:

- **Project Planning:**
    - Techniques for planning electrical engineering projects.
- **Resource Management:**
    - Managing resources effectively in electrical projects.
- **Risk Management:**
    - Identifying and mitigating risks.

Integral and Derivative Calculations in Project Management

Project Planning

Techniques for planning electrical engineering projects:

- **Integral Calculations:**
    - **Total Project Time:** $$ T = \int_0^N t_i \, di $$
        - Where TT is the total project time, tit_i is the time for each task, and NN is the total number of tasks.
    - **Cumulative Budget:** $$ B = \int_0^T b(t) \, dt $$
        - Where BB is the total budget, and b(t)b(t) is the budget allocation over time TT.
- **Derivative Calculations:**
    - **Rate of Task Completion:** $$ \frac{dN}{dt} = \text{Rate of Task Completion} $$
        - Where NN is the number of completed tasks, and tt is the time.

Example:

- Creating Gantt charts and project timelines by integrating task durations to visualize the overall project schedule.

Resource Management

Managing resources effectively in electrical projects:

- **Integral Calculations:**
    - **Total Resource Allocation:** $$ R = \int_0^T r(t) \, dt $$
        - Where RR is the total resource allocation, and r(t)r(t) is the resource allocation rate over time TT.
- **Derivative Calculations:**
    - **Rate of Resource Utilization:** $$ \frac{dR}{dt} = \text{Rate of Resource Utilization} $$
        - Where RR is the resource utilization, and tt is the time.

Example:

- Estimating the total amount of resources (e.g., labor, equipment) needed for the project by integrating resource usage over time.

Risk Management

Identifying and mitigating risks:

- **Integral Calculations:**
    - **Cumulative Risk Impact:** $$ I = \int_0^T i(t) \, dt $$
        - Where II is the total risk impact, and i(t)i(t) is the impact of risks over time TT.
- **Derivative Calculations:**
    - **Rate of Risk Occurrence:** $$ \frac{dR}{dt} = \text{Rate of Risk Occurrence} $$
        - Where RR is the risk occurrence, and tt is the time

Wind Energy, Solar Energy, and Hydroelectric Power

Wind Energy: Understanding the Technology and Integration

- **Integral Calculations:**
    - **Total Power Output:** $$ P_{\text{total}} = \int_0^T P(t) \, dt $$
        - Where PtotalP_{\text{total}} is the total power output over time TT, and P(t)P(t) is the power at time tt.
    - **Energy Harvested:** $$ E = \int_0^T \frac{1}{2} \rho A v^3 \eta \, dt $$
        - Where EE is the energy harvested, ρ\rho is the air density, AA is the swept area of the turbine blades, vv is the wind speed, and η\eta is the efficiency.
- **Derivative Calculations:**

- **Rate of Change of Power Output:** $$ \frac{dP}{dt} $$
    - Where PP is the power output and tt is the time.

Solar Energy: Exploring Photovoltaic Systems

- **Integral Calculations:**
    - **Total Energy Generated:** $$ E_{\text{total}} = \int_0^T P(t) \, dt $$
        - Where EtotalE_{\text{total}} is the total energy generated, and P(t)P(t) is the power output at time tt.
    - **Energy Efficiency:** $$ \eta = \frac{E_{\text{generated}}}{E_{\text{incident}}} $$
        - Where η\eta is the efficiency, EgeneratedE_{\text{generated}} is the energy generated by the solar panel, and EincidentE_{\text{incident}} is the incident solar energy.
- **Derivative Calculations:**
    - **Rate of Energy Generation:** $$ \frac{dE}{dt} = P(t) $$
        - Where EE is the energy and tt is the time.

Hydroelectric Power: Implementing Hydroelectric Systems

- **Integral Calculations:**
    - **Total Energy Production:** $$ E = \int_0^T P(t) \, dt $$
        - Where EE is the total energy production, and P(t)P(t) is the power output at time tt.
    - **Hydraulic Head Calculation:** $$ H = \int_{z_1}^{z_2} dz $$
        - Where HH is the hydraulic head, and z1z_1 and z2z_2 are the initial and final elevation levels.
- **Derivative Calculations:**
    - **Rate of Flow:** $$ \frac{dQ}{dt} $$

        - Where QQ is the flow rate and tt is the time.

Electrical Infrastructure Design and Management

Infrastructure Planning

- **Integral Calculations:**
    - **Total Project Time:** $$ T_{\text{total}} = \int_0^N t_i \, di $$
        - Where TtotalT_{\text{total}} is the total project time, tit_i is the time for each task, and NN is the total number of tasks.
- **Derivative Calculations:**
    - **Rate of Task Completion:** $$ \frac{dT}{dt} $$
        - Where TT is the number of completed tasks, and tt is the time.

Design Methodologies

- **Integral Calculations:**
    - **Total Resource Allocation:** $$ R = \int_0^T r(t) \, dt $$
        - Where RR is the total resource allocation, and r(t)r(t) is the resource allocation rate over time TT.
- **Derivative Calculations:**
    - **Rate of Design Completion:** $$ \frac{dD}{dt} $$
        - Where DD is the design progress, and tt is the time.

Management Practices

- **Integral Calculations:**
    - **Total Cost:** $$ C_{\text{total}} = \int_0^T c(t) \, dt $$
        - Where CtotalC_{\text{total}} is the total cost, and c(t)c(t) is the cost over time TT.
- **Derivative Calculations:**

- **Rate of Cost Increase:** $$ \frac{dC}{dt} $$
    - Where CC is the cost, and tt is the time.

Smart Grids and IoT Applications

Smart Grid Technology

- **Integral Calculations:**
    - **Total Energy Savings:** $$ E_{\text{total}} = \int_0^T \left(E_{\text{conventional}} - E_{\text{smart}} \right) \, dt $$
        - Where EtotalE_{\text{total}} is the total energy savings, EconventionalE_{\text{conventional}} is the energy consumption of conventional grids, and EsmartE_{\text{smart}} is the energy consumption of smart grids.
- **Derivative Calculations:**
    - **Rate of Energy Consumption:** $$ \frac{dE}{dt} $$
        - Where EE is the energy consumption, and tt is the time.

IoT in Electrical Systems

- **Integral Calculations:**
    - **Total Data Collected:** $$ D_{\text{total}} = \int_0^T d(t) \, dt $$
        - Where DtotalD_{\text{total}} is the total data collected, and d(t)d(t) is the data collection rate over time TT.
- **Derivative Calculations:**
    - **Rate of Data Transmission:** $$ \frac{dD}{dt} $$
        - Where DD is the data collected, and tt is the time.

Overview of wireless communication systems, historical developments, and contemporary applications:

- **Historical Developments:**
    - From Marconi's first transatlantic radio transmission to modern cellular networks.
- **Contemporary Applications:**
    - Smartphones, IoT devices, satellite communications, and Wi-Fi networks.

29.3 Radio Frequency Fundamentals

Exploration of radio frequency (RF) spectrum, key RF principles, and their application in wireless communication:

- **RF Spectrum:**
    - Allocation of frequencies for different communication services.
- **Key RF Principles:**
    - Frequency, wavelength, and their relation: $$ \lambda = \ frac{c}{f} $$ Where λ\lambda is the wavelength, cc is the speed of light, and ff is the frequency.

29.4 Wireless Signal Propagation

Understanding the behavior of wireless signals over various media and environments, including path loss, fading, and interference:

- **Path Loss:**
    - Free-space path loss calculation: $$ PL = 20 \log_{10}\left(\ frac{4\pi d f}{c}\right) $$ Where PLPL is the path loss, dd is the distance, ff is the frequency, and cc is the speed of light.
- **Fading:**
    - Types of fading: multipath, shadowing, and Doppler effect.
- **Interference:**
    - Sources and mitigation techniques.

29.5 Multiple Access Techniques

Survey of multiple access schemes including FDMA, TDMA, CDMA, and OFDMA, which enable multiple users to share the same frequency band:

- **FDMA (Frequency Division Multiple Access):**
    - Dividing the frequency band into distinct channels.
- **TDMA (Time Division Multiple Access):**
    - Dividing the time into slots for different users.
- **CDMA (Code Division Multiple Access):**
    - Using unique codes for each user to share the same frequency band.
- **OFDMA (Orthogonal Frequency Division Multiple Access):**
    - Subdividing the frequency band into orthogonal sub-carriers.

29.6 Wireless Networking and Protocols

Introduction to wireless network design, including protocol layers, network architectures, and routing protocols:

- **Protocol Layers:**
    - Understanding the OSI model and TCP/IP stack.
- **Network Architectures:**
    - Cellular, ad hoc, mesh, and hybrid networks.
- **Routing Protocols:**
    - AODV, DSR, and OLSR.

29.7 Cellular Systems and 5G

In-depth analysis of cellular network architecture, with a focus on the evolution from 1G to 5G, and future trends:

- **1G to 4G Evolution:**
    - Analog to digital, increased data rates, and enhanced services.

- **5G Technology:**
    - Enhanced mobile broadband (eMBB), massive machine-type communications (mMTC), and ultra-reliable low-latency communications (URLLC).
- **Future Trends:**
    - 6G, AI in telecommunications, and beyond.

29.8 Antenna Theory and Design

Integral and Derivative Calculations in Antenna Theory:

- **Integral Calculations:**
    - **Radiation Pattern Integration:** $$ P_{\text{rad}} = \int_0^{2\pi} \int_0^\pi U(\theta, \phi) \sin \theta \, d\theta \, d\phi $$ Where PradP_{\text{rad}} is the total radiated power, U(θ,ϕ)U(\theta, \phi) is the radiation intensity, and θ\theta and ϕ\phi are the spherical coordinates.
- **Derivative Calculations:**
    - **Antenna Gain:** $$ G(\theta, \phi) = \frac{dU(\theta, \phi)}{dP_{\text{in}}} $$ Where G(θ,ϕ)G(\theta, \phi) is the antenna gain, U(θ,ϕ)U(\theta, \phi) is the radiation intensity, and PinP_{\text{in}} is the input power.

Understanding the Basic Concepts of Social Media Marketing

Social media marketing involves using platforms like Facebook, Instagram, Twitter, LinkedIn, and TikTok to promote products, services, or brands. The goal is to engage with potential customers, build relationships, and drive traffic to websites or online stores.

Here's a breakdown of some key concepts:

1. Audience Engagement:

- **Integral Calculations:**
    - **Total Engagement:** $$ E_{\text{total}} = \int_0^T E(t) \, dt $$

        - Where EtotalE_{\text{total}} is the total engagement over time TT, and E(t)E(t) is the engagement rate at time tt.

2. Content Reach:

- **Derivative Calculations:**
    - **Rate of Reach:** $$ \frac{dR}{dt} $$
        - Where RR is the reach, and tt is the time.

3. Conversion Rates:

- **Integral Calculations:**
    - **Total Conversions:** $$ C_{\text{total}} = \int_0^T C(t) \, dt $$
        - Where CtotalC_{\text{total}} is the total conversions over time TT, and C(t)C(t) is the conversion rate at time tt.

Television and Radio Production Essentials

An introduction to the fundamentals of television and radio production, focusing on skills necessary for creating high-quality media content.

Key Topics:

Television Production Basics

Camera Operation and Techniques:

- **Integral Calculations:**
    - **Total Recording Time:** $$ T_{\text{recording}} = \int_0^N t_i \, di $$
        - Where TrecordingT_{\text{recording}} is the total recording time, tit_i is the time for each segment, and NN is the number of segments.

Lighting and Sound Design:

- **Integral Calculations:**

- **Total Light Exposure:** $$ E_{\text{light}} = \int_0^T L(t) \, dt $$
    - Where ElightE_{\text{light}} is the total light exposure, L(t)L(t) is the light intensity over time TT.

Directing and Producing TV Segments:

- **Derivative Calculations:**
    - **Rate of Scene Transition:** $$ \frac{dS}{dt} $$
        - Where SS is the number of scene transitions, and tt is the time.

Radio Production Basics

Audio Recording and Editing:

- **Integral Calculations:**
    - **Total Audio Duration:** $$ T_{\text{audio}} = \int_0^N t_i \, di $$
        - Where TaudioT_{\text{audio}} is the total audio duration, tit_i is the time for each audio clip, and NN is the number of clips.

Scriptwriting for Radio Broadcasts:

- **Derivative Calculations:**
    - **Rate of Script Progress:** $$ \frac{dW}{dt} $$
        - Where WW is the number of words written, and tt is the time.

Hosting and Interviewing Techniques:

- **Integral Calculations:**
    - **Total Interview Duration:** $$ T_{\text{interview}} = \int_0^N t_i \, di $$

        - Where TinterviewT_{\text{interview}} is the total interview duration, tit_i is the time for each interview, and NN is the number of interviews.

Advanced Production Skills

Multi-Camera Setups and Live Broadcasting:

- **Integral Calculations:**
    - **Total Camera Coverage:** $$ C_{\text{total}} = \int_0^T C(t) \, dt $$
        - Where CtotalC_{\text{total}} is the total camera coverage, and C(t)C(t) is the camera coverage at time TT.

Post-Production Editing and Special Effects:

- **Derivative Calculations:**
    - **Rate of Editing Progress:** $$ \frac{dE}{dt} $$
        - Where EE is the amount of editing completed, and tt is the time.

Integrating Graphics and Animations:

- **Integral Calculations:**
    - **Total Animation Duration:** $$ T_{\text{animation}} = \int_0^N t_i \, di $$
        - Where TanimationT_{\text{animation}} is the total animation duration, tit_i is the time for each animation, and NN is the number of animations.

Production Software

Inbox

R

Roberto Aldrett - AIU 6:31 AM (10 hours ago)

to me

Atlantic International University

A New Age for Distance Learning

Admissions Department - Atlantic International University

From: **Roberto Aldrett**, Communications Coordinator

1/28/2025

tshingombe tshitadi

Applying for: Masters of

Johannesburg South Africa

Dear tshingombe

I am writing to let you know that your acceptance and placement offer to you is set, your Virtual Campuses (Academic and MYAUI) have been created. I want to express to you how delighted the AIU community is that you will be joining a very selected number of students from more than 160 countries of the world. Your placement for the Masters of will be secured after we received your registration fee that is due on **31st of January, 2025.**. Remember at AIU, registration / application fee and first tuition is all the same (One small single payment).

To understand the real meaning of AIU
Degrees: https://vimeo.com/549087436/34bc313fc5

To complete your application:

- Make sure you have read your Admission letter and payment plan.

- Send us your CV and all academic documents. It is very important!

- Do your application payment. In case of admission, it will be applied as

your registration fee.

Application Fee: 150 USD

You can do a direct payment with your **Visa, Master Card, or American Express Credit or Debit Card** here:

Click to pay: https://securepayments.aiu.edu

Or you can use the following methods of Payment:

3. **WIRE TRANSFER**

Citi Bank

Name of the Account: Atlantic International University Account Number: 9137954440 ABA/Routing Number: 021000089 (International)

ABA/Routing Number: 266086554 (US /Domestic) SWIFT Code: CITIUS33 Address of the Bank: 399 Park Avenue, New York, NY 10043

PLEASE IF YOU DO AN ONLINE TRANSFFER FROM ACCOUNT TO ACCOUNT PLEASE SEND THE RECEIPT AND YOUR COMPLETE INFORMATION IN ORDER FOR US TO POST YOUR PAYMENT CORRECTLY OR SEND YOUR RECEIPT BY EMAIL TO roberto @aiu.edu or FINANCE@AIU.EDU

11. **PayPal:** If you have a PayPal account use the following information:

Name: Atlantic International University

E-mail: admissions@aiu.edu

Please make sure you add the 4% PayPal charges when sending a payment. Please upload your receipt through your student section.

https://www.aiu.edu/tuition/

12. **Zelle Payments**

E-mail: finance@aiu.edu

Please upload or email your confirmation receipt for us to verify your payment.

13. **Klasha (Africa including South Africa, Nigeria, Kenya, Ghana, Zambia, and Tanzania)**

From the convenience of your mobile device, KLASHA will allow you to send payments using a local credit card or local transfer to AIU. This method will help you reduce fees and save time when paying your fees.

If you would like to pay via Klasha download our mobile app on **Google play store** **or** **IOS**

and set up the account. After which you can fund the account and use the money in the wallet to make transactions.

If you already to pay, please click on the link below:

Click to Pay Now: https://aiusecurepayments.org/klasha/

14. **Cryptocurrency** (Bitcoin, Ethereum, DAI, US coin, etc.)

To learn more about this payment method, we encourage you to watch the
video : https://vimeo.com/657490143/09955932e8

If you would like to use this payment method, please click on the link below, scroll to the bottom of the tuition page and select your payment method.

https://www.aiu.edu/tuition/

15. **Western Union: Quick Collect**

Name: Atlantic International University

Company Code: ATLANTICUNIVERSITYHI

Account Number: Provisional Student ID

The transaction fee will vary from country to country.

IMPORTANT: Take in consideration that we are not a person, but an institution. So, you can't do a person to person transaction but a Quickpay or Quick Collect. WESTERN UNION QUICKPAY or QUICK COLLECT is the option to pay for your tuition. Sometimes you have to insist the Western Union representative that you need to do a Quickpay or a Quick Collect.

We look forward to helping you with your studies. I appreciate

your confidence in me and am very happy that you are joining AIU.

Sincerely,

Roberto Aldrett - roberto@aiu.edu
- Communications Coordinator -
Atlantic International University - http://www.aiu.edu
900 Fort Street - 905, Honolulu Hawaii 96813. USA

100% Distance Learning Online University

¡Save Time and Enroll Today!

Would you like to see the tuition fees of your program and areas of study available? Complete the Online Application below and accelerate your qualification process:

CLICK HERE to Complete Your Online Application

Benefits of the Online Application

1. Do you need to apply for Financial Assistance?

Complete the application and select the monthly payments plan in order to apply for Financial Assistance. You will be able to create a custom payment plan with a partial scholarship.

2. How can you complete your enrollment?

After completing your online application, you will be able to pay your enrollment fee online by card or PayPal, or receive payment instructions for Wire Transfers and Western Union

3. Would you like to learn more about your program?

Complete the application to receive a complete list of the most common questions and answers regarding your studies at AIU, such as program length, courses, mode of study and more.

Advantages of studying online with AIU

√ **100% Online Studies through AIU's Virtual Campus** (student section open 24/7). Select a flexible class schedule and study from your location through your computer or smartphone.

√ **Online Library** with more than 130 thousand books at no additional cost!

√ **Andragogic Studies and Open Academic Curriculum**

Select courses of your interest by building your course outline

√ **Human Development Center:** Access the My AIU Platform

Admissions Steps to Enroll at AIU

1. Complete Your Online Application - Pending

You will receive your Admissions Letter after your application has been reviewed.

2. Complete Your Enrollment Fee Payment - Pending

This step must be completed in order to continue to Step 3. You will receive instructions according to your selected payment method after receiving your Admissions Letter.

3. Upload Your Previous Academic Diploma - Pending

After completing Steps 1 & 2, you will receive the Orientation Package with guidelines on how to submit your previous academic diplomas and transcripts on your student section.

4. Begin Your Studies - Pending

This is the final step where you will be able to select your courses and begin your studies at Atlantic International University.

If you have any questions, feel free to contact us or visit our website for more information.

Apply Now

ar Future AIU Student tshingombe

25 Year Anniversary | AIU
Atlantic International University

Unique & Unrepeatable!

Login to Your Online Platform

Complete Your Enrollment Fee Payment of US $150 today

You told me your goals, about how you want to increase your income and just have an opportunity for growth, do not put this dream on hold.

Therefore I have extended your enrollment deadline until January 24, 2025 with the scholarship you were awarded.

Access your online Student Section and start studying your Masters Degree in electrical engineering by completing your AIU enrollment and gaining immediate access to your online student section today!

Payment Plan Summary:

Degree: Masters in electrical engineering

Enrollment Fee: $150 US

If you submit a successful payment with a credit card, you will receive a payment confirmation email and enrollment fee will be processed much faster and receive immediate access to your Online Student Section!

Dear tshingombe tshitadi,

We received your request to apply for a Masters partial scholarship at Atlantic International University on 12/17/2024 10:49:16 PM

Please update your application below including the financial part to see what max scholarship you qualify for in the next 48 hours.

Discover some of the UNIQUE benefits of studying at AIU:

- Reach your maximum POTENTIAL
- Choose YOUR courses and design your perfect **100% customized**

program outline

- Study anywhere from your mobile or computer through our **online student section open 24/7**
- Generate solutions to any challenge you face.

Complete Your Enrollment Fee Payment of US $150 today

You told me your goals, about how you want to increase your income and just have an opportunity for growth, do not put this dream on hold.

Therefore I have extended your enrollment deadline until January 24, 2025 with the scholarship you were awarded.

Access your online Student Section and start studying your Masters Degree in electrical engineering by completing your AIU enrollment and gaining immediate access to your online student section today!

-

Awarded

We're excited to grant you exclusive live class access this week!.

This special opportunity allows you to log in to any class you choose, all week long, and experience firsthand the valuable knowledge and skills you'll gain when you enroll in your Masters program.

Ready to take the next step? **Update your application today and secure the scholarship you deserve.** Don't miss this chance to start building your future!:

Career Coach

Looking for an opportunity at AIU? Complete the following application form in order to apply for current or future positions at AIU, if you want to search for current positions in other companies, you can use our search engine by clicking here, please be advised that you will be redirected to outside websites.

Complete the following application form in order to apply for current or future positions at AIU, if you want to search for current positions in other companies, you can use our search engine by clicking here, please be advised that you will be redirected to outside websites.

Job Search Outside AIU

Position of your interest

Academic/Faculty Administrative/Student Services Finance/Accounting Researcher/Co-Author Admissions

Upload your Resume/CV

List the Institutions and Degrees you have completed

List the Companies/positions you have worked in

What languages do you speak (%Proficiency)?

What languages do you write (%Proficiency)?

Other Languages:

List Research Projects you have participated in:

Are you looking for a Full time or Part time position?

What is the $/Hr minimum you would like to receive from AIU

Can you travel outside of the US to present conferences on behalf of AIU?

Yes No

What do you think about Distance Learning?

What do you think about Accreditation in the US?

Do you consider yourself Competent at using computers, Internet and Basic Programs?

Yes No

Which Programs:

List Publications you have published or co-authored:

Your submission was successful.

Life-Coach Consulting

Life-coach consulting is a concept that involves a professional relationship between a trained and certified life coach and an individual seeking guidance and support in various areas of their life. The aim of life-coach consulting is to empower individuals to make positive changes, set and achieve goals, overcome obstacles, and ultimately live a more fulfilling and balanced life.

Are you ready to live this experience?

Location: Redlands CA

Specialty: People in career or life transition. Mentoring other coaches. Small business owners and entrepreneurs. Busy professionals who want a life! Scientifically validated DISC and Values assessments. LifeTrek, Inc.

Location: Bexley, OH

Master in Modern Power and Energy Systems

Program Overview

The master’s program offered at Atlantic International University (AIU) provides students the opportunity to gain expert knowledge in power and energy systems. With the growing demand for renewable energy sources and the urgency to protect our environment, the program prepares engineers to tackle these issues. It provides students with the management and technical tools necessary to plan and deliver sustainable, energy-efficient systems effectively.

Core Courses and Topics in Modern Power and Energy Systems

1.

Economic Decision Making

2.
3.

Fundamentals of Energy System Integration

4.
5.

Mathematical Methods of Mechanical Engineers 1

6.
7.

Wind Energy Systems

8.
9.

A.I. in Energy Systems

10.
11.

Solar Thermal Engineering

12.
13.

Engineering Project Management

14.
15.

Random Signals and Noise

16.
17.

Circuits and Systems II

18.
19.

Signals and Systems

20.
21.

Energy Conversion

22.
23.

Electromagnetic Fields I

24.
25.

Electronic Circuits I

26.
27.

Linear Systems

28.

29.

Power System Steady-State Analysis

30.
31.

Transients in Power Systems

32.
33.

Power Electronics

34.
35.

Renewable Energy Systems

36.

Orientation Courses

1.

Communication & Investigation (Comprehensive Resume)

2.
3.

Organization Theory (Portfolio)

4.
5.

Experiential Learning (Autobiography)

6.
7.

Academic Evaluation (Questionnaire)

8.
9.

Fundament of Knowledge (Integration Chart)

10.
11.

Fundamental Principles I (Philosophy of Education)

12.
13.

Professional Evaluation (Self Evaluation Matrix)

14.
15.

Development of Graduate Study (Guarantee of an Academic Degree)

16.

Research Project in Modern Power and Energy Systems

-

Masters Thesis Project

-
-

MBM300 Thesis Proposal

-
-

MBM302 Master Thesis (7,500 words)

-
-

Publication: Each Master of Education graduate is encouraged to publish their research papers either online in the public domain or through professional journals and periodicals worldwide.

-

Employment Opportunities in Modern Power and Energy Systems

-

Power Systems Engineer

-
-

Power System Analyst

-
-

Director of Energy Systems

-
-

Lead Engineer

-
-

Power System Modeling Engineer

-
-

Senior Manager

-

AIU's Unique Curriculum Design

AIU offers a flexible, open curriculum design tailored to each student's needs. This allows students to focus on their strengths and address weaknesses while aligning their education with market opportunities in their intended field of work.

Master in Renewable Energy

Program Overview

The Master of Renewable Energy program at AIU helps students develop practical skills and knowledge required to critically evaluate alternative energy sources and provide applied solutions to the energy demand. The major is interdisciplinary, focusing on natural processes related to renewable energy and employing the scientific method.

Core Courses and Topics in Renewable Energy

1.

Introduction to Renewable Energy

2.
3.

Solar Thermal Energy

4.
5.

Solar Photovoltaics

6.
7.

Global Change

8.
9.

Bioenergy

10.
11.

Geothermal Energy

12.
13.

Hydroelectricity

14.
15.

Tidal Power

16.
17.

Natural Resource Management

18.
19.

Wind Energy

20.
21.

Wave Energy

22.

Orientation Courses

1.

Communication & Investigation (Comprehensive Resume)

2.
3.

Organization Theory (Portfolio)

4.
5.

Experiential Learning (Autobiography)

6.
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13.

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14.
15.

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16.

Bibliographic Resources

For Modern Power and Energy Systems

1.

Glover, J. D., Sarma, M. S., & Overbye, T. J. (2016). *Power System Analysis and Design*. Cengage Learning.

2.
3.

Masters, G. M. (2013). *Renewable and Efficient Electric Power Systems*. Wiley-IEEE Press.

4.
5.

Balanis, C. A. (2012). *Advanced Engineering Electromagnetics*. Wiley.

6.

For Renewable Energy Systems

1.

Boyle, G. (2004). *Renewable Energy: Power for a Sustainable Future*. Oxford University Press.

2.
3.

Jenkins, D. (2013). *Renewable Energy Systems: The Earthscan Expert Guide to Renewable Energy Technologies for Home and Business*. Routledge.

4.
5.

Twidell, J., & Weir, T. (2015). *Renewable Energy Resources*. Routledge.

6.

Additional Resources

1.

Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. SAGE Publications.

2.
3.

Murray, R. (2011). *How to Write a Thesis*. Open University Press.

4.
5.

Franklin, G. F., Powell, J. D., & Emami-Naeini, A. (2015). *Feedback Control of Dynamic Systems*. Pearson.

6.

These courses and resources should provide a strong foundation in modern power and energy systems as well as renewable energy systems. If

Subject:

- **ctuarial Science**
- **Animal Science**
- **Biomass and Biofuels**
- **Crops and Soils**
- **Developing Mobile Applications**
- **Ecotechnology**
- **Solar Energy**
- **Graphic Design**
- **Health Informatics**
- **Mathematics Didactics**
- **Multimedia Design and Digital Art**
- **Science in Geophysics**

- **Science in Sport**
- **Science in Sustainable Materials**
- **Science in the Atmosphere**
- **Wind Energy**
- **Agronomic Engineering**
- **Degree Robotics**
- **Engineering in Oil, Gas, and Energy**

- **Genetics**
- **Cybersecurity and Hacking**
- **Exercise Science**
- **Biosystems Engineering**
- **Technology in Network Interconnection**
- **Technology inCognitive Science**
- **Bioengineering**
- **Environmental Toxicology**
- **Forensic Consulting**
- **Engineering in Metallurgy**
- **Farming Science**
- **Synthetic Biology**
- **Systems and Databases**
- **Media Education**
- **(Biology Teaching)**
- **Sustainable Design and**
- **Construction**
- **Environmental Sciences**

The Future Of Science and Engineering

The future of science and engineering careers is bright. With the advent of new technologies, there are now many new opportunities.

By following these tips, you can ensure that your career path is a long one:

- Keep up with all of the newest developments in your field. If you aren't aware of changes in your area, you'll be left behind by those who are. For example, if you're a software developer, make sure you're familiar with the latest programming languages and frameworks trends.

- Don’t be afraid to try something new. It’s not always easy to learn a new skill or take on a new role. But by doing so, you’ll be able to expand your horizons and gain an edge over your competition.
- Stay current with the latest tools and techniques. In today’s world, it’s more important than ever to stay ahead of the curve. If you don’t know what’s happening in your industry, you’ll be at a competitive disadvantage.

The Constantly Changing Education Landscape

As people start to emerge from the devastation of COVID-19, everyone is asking the same question: What should education look like in a post-pandemic world?

The truth is that many aspects of the education system — from where and how we learn to what we study — need to be transformed if we want an education system that is relevant to our current world.

Here are four significant areas in which our education system needs to change:

Students expect to have the ability to learn from anywhere. This is probably one of the most obvious changes brought about by recent events: students now expect to be able to pursue their studies from any location. This versatility is vital for those students who cannot physically attend classes due to health and safety concerns or because they live in remote locations.

Student mobility is also an essential factor here. Students want the opportunity to study abroad, but they don’t necessarily want or need to move overseas permanently. Remote learning options make it easier for students to move around while studying without disrupting their academic progress.

Students expect active learning rather than lectures. Students are looking for different learning experiences, such as more active, hands-on learning rather than traditional lectures.

Our world is constantly changing, and the taught skills must change with it. To create a more equitable, just, and sustainable world, we need to get better at teaching science and engineering. Science education has the power to transform lives, improve health and livelihoods, increase wealth and drive economic growth. It can also help close the gender gap in STEM fields (science, technology, engineering, math).

If we want to change the world of science and engineering for the better, we need to find ways of supporting people who have been excluded from these fields in the past. We must do this by providing equal opportunities for everyone regardless of their race or gender identity. This change means creating spaces where people can engage with science without feeling like outsiders or imposters. We also need more women leaders who will serve as role models for young girls interested in pursuing careers related to STEM subjects.

Academic Freedom to Discover Your Purpose
Open Curriculum Design at Atlantic International University

The Master of Engineering Systems program is offered online via distance learning. After evaluating both academic record and life experience, AIU staff working in conjunction with Faculty and Academic Advisors will assist students in setting up a custom-made program, designed on an individual basis. This flexibility to meet student needs is seldom found in other distance learning programs. Our online program does not require all students to take the same subjects/courses, use the same books, or learning materials. Instead, the online Master of Engineering Systems curriculum is designed individually by the student and academic advisor.

It specifically addresses strengths and weaknesses with respect to market opportunities in the student's major and intended field of work. Understanding that industry and geographic factors should influence the content of the curriculum instead of a standardized one-fits-all design is the hallmark of AIU's unique approach to adult education. This philosophy addresses the dynamic and constantly changing environment of working professionals by helping adult students in reaching their professional and personal goals within the scope of the degree program.

Important: Below is an example of the topics or areas you may develop and work on during your studies. By no means is it a complete or required list as AIU programs do not follow a standardized curriculum. It is meant solely as a reference point and example. Want to learn more about the curriculum design at AIU? (Course and Curriculum)

Core Courses and Topics in Engineering Systems:

Applied Physics
Supply Chain Management
Global Competitive Environment
Legal Environment of Business
Total Quality Management and Improvement
Management of Systems Projects
Engineering Analysis for Decision Making

Engineering Management Control Systems
Engineering Economy
Systems Optimization and Analysis
Systems Testing and Reliability
Systems Engineering Management
Systems Engineering Design

Orientation Courses:

Communication & Investigation (Comprehensive Resume)
Organization Theory (Portfolio)
Experiential Learning (Autobiography)
Academic Evaluation (Questionnaire)
Fundament of Knowledge (Integration Chart)
Fundamental Principles I (Philosophy of Education)
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MBM302 Master Thesis (7,500 words)
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professionals by helping adult students in reaching their professional and personal goals within the scope of the degree program.

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Engineering Analysis for Decision Making

Engineering Management Control Systems
Engineering Economy
Systems Optimization and Analysis
Systems Testing and Reliability
Systems Engineering Management
Systems Engineering Design

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Masters Thesis Project
MBM300 Thesis Proposal
MBM302 Master Thesis (7,500 words)
Publication: Each Master of Engineering Systems graduate is encouraged to publish their research papers either online in the public domain or through professional journals and per

Academic Freedom to Discover Your Purpose
Open Curriculum Design at Atlantic International University

The Master of Engineering Systems program is offered online via distance learning. After evaluating both academic record and life experience, AIU staff working in conjunction with Faculty and Academic Advisors will assist students in setting up a custom-made program, designed on an individual basis. This flexibility to meet student needs is seldom found in other distance learning programs. Our online program does not require all students to take the same subjects/courses, use the same books, or learning materials. Instead, the online Master of Engineering Systems curriculum is designed individually by the student and academic advisor.

It specifically addresses strengths and weaknesses with respect to market opportunities in the student's major and intended field of work. Understanding that industry and geographic factors should influence the content of the curriculum instead of a standardized one-fits-all design is the hallmark of AIU's unique approach to adult education. This philosophy addresses the dynamic and constantly changing environment of working professionals by helping adult students in reaching their professional and personal goals within the scope of the degree program.

Important: Below is an example of the topics or areas you may develop and work on during your studies. By no means is it a complete or required list as AIU programs do not follow a standardized curriculum. It is meant solely as a reference point and example. Want to learn more about the curriculum design at AIU? (Course and Curriculum)

Core Courses and Topics in Engineering Systems:

Applied Physics
Supply Chain Management
Global Competitive Environment
Legal Environment of Business
Total Quality Management and Improvement
Management of Systems Projects
Engineering Analysis for Decision Making

Engineering Management Control Systems
Engineering Economy
Systems Optimization and Analysis
Systems Testing and Reliability
Systems Engineering Management
Systems Engineering Design

Orientation Courses:

Communication & Investigation (Comprehensive Resume)
Organization Theory (Portfolio)
Experiential Learning (Autobiography)
Academic Evaluation (Questionnaire)
Fundament of Knowledge (Integration Chart)
Fundamental Principles I (Philosophy of Education)
Professional Evaluation (Self Evaluation Matrix)
Development of Graduate Study (Guarantee of an Academic Degree)

Research Project in Engineering Systems:

Masters Thesis Project
MBM300 Thesis Proposal
MBM302 Master Thesis (7,500 words)
Publication: Each Master of Engineering Systems graduate is encouraged to publish their research papers either online in the public domain or through professional journals and per

Courses and Topics in Doctorate in Electrical Engineering

A Doctorate in Electrical Engineering typically involves a combination of advanced coursework and independent research. In a Doctorate in Electrical Engineering, students typically explore advanced topics such as Electromagnetics, Signal Processing, Analog and Digital Circuits, Control Systems, Power Systems, and Communication Systems.

Specialized courses vary by research focus, covering areas like Nanoelectronics, Wireless Communication, Renewable Energy, VLSI Design, and Machine Learning. The program also includes seminars, interdisciplinary courses, and professional development to prepare students for research and leadership roles, culminating in a significant dissertation project.

AIU’s Doctorate in Electrical Engineering offers advanced courses like Electromagnetic Theory, Digital Systems Design, Renewable Energy Technologies, Robotics and Automation, and Advanced Control Systems. Students engage in extensive research, publish academic papers, and collaborate with faculty mentors. The program includes comprehensive exams and a substantial dissertation project. AIU’s emphasis on hands-on experience and cutting-edge technology ensures graduates are well-prepared for impactful careers in academia and industry.

- Advanced Electromagnetic Theory
- Digital Signal Processing
- Control Systems Design
- Advanced Communication Systems

- Power Systems Engineering
- Renewable Energy Systems
- VLSI (Very Large Scale Integration) Design
- Machine Learning in Electrical Engineering

Orientation Course

Orientation courses for a Doctorate in Electrical Engineering provide essential groundwork for doctoral students. These typically encompass research methodologies, academic writing, and ethics. Students gain insights into departmental and university policies and resources, meet faculty members, and build connections with peers. These courses help students acclimate to the academic environment, ensuring they are well-prepared to embark on their research journey, meet program requirements, and make the most of their doctoral experience.

Furthermore, orientation courses serve to familiarize students with the academic rigor and research methodologies they will encounter, alleviating apprehensions and enhancing their readiness. In essence, these courses play a pivotal role in guaranteeing that doctoral candidates commence their program with self-assurance, concentration, and a profound grasp of the road ahead, laying the foundation for a prosperous journey in educational leadership.

- Communication & Investigation (Comprehensive Resume)
- Organization Theory (Portfolio)
- Experiential Learning (Autobiography)
- Academic Evaluation (Questionnaire)

- Fundament of Knowledge (Integration Chart)
- Fundamental Principles I (Philosophy of Education)
- Professional Evaluation (Self Evaluation Matrix)
- Development of Graduate Study (Guarantee of an Academic Degree)

Research Projects in Doctorate in Electrical Engineering

Doctorate in Electrical Engineering research projects encompass diverse areas, such as Power Systems and Renewable Energy (improving smart grids and renewable integration), Electronics and VLSI Design (creating advanced integrated circuits), Signal Processing and Communications (enhancing data transmission and wireless tech), Control Systems and Robotics (advancing automation), Photonics and Optoelectronics (applications in optical communication), Machine Learning and AI (solving EE problems), Nanotechnology (nano-material applications), Electromagnetics (antennas and electromagnetic compatibility), Cybersecurity in Electrical Systems (protecting infrastructure), and Biomedical Engineering (developing medical devices). These projects demand extensive research, publications, and collaboration with the aim of advancing technology, making graduates adept in academia and industry.

Research projects in a Doctorate in Electrical Engineering offer several advantages. They foster innovation, deepen technical expertise, and contribute to the field's advancement. These projects develop critical thinking, problem-solving, and collaboration skills. They also provide opportunities for networking, publishing research, and potential industry partnerships, enhancing career prospects and positioning graduates as experts in cutting-edge technology and problem-solving.

- Doctoral Dissertation Project
- MBM900 Doctoral Proposal
- MBM902 Doctoral Dissertation (15,000 words)

Publication – Additionally, these endeavors empower graduates with capabilities that transcend their academic pursuits, unlocking diverse career pathways in educational leadership, research, policy formulation,

and various other fields. Hence, for individuals embarking on a Doctorate in Electrical Engineering, research projects serve as the guiding force, directing them toward a future that promises enhanced educational equity and advancement.

Coverage topic exam

5.2Advanced Electromagnetic Theory Digital Signal Processing Control Systems Design Advanced Communication Systems Power Systems Engineering Renewable Energy Systems VLSI (Very Large Scale Integration) Design Machine Learning in Electrical Engineering

Those topics sound like an exciting dive into the world of Electrical Engineering! They encompass a broad spectrum of concepts and applications. Here's a brief overview of each topic:

1.

Advanced Electromagnetic Theory: This delves into Maxwell's equations, electromagnetic waves, and their applications in various fields such as antenna design, microwave engineering, and more.

2.
3.

Digital Signal Processing (DSP): This involves the analysis and manipulation of signals. It's crucial in areas such as communications, audio and speech processing, radar, and image processing.

4.
5.

Control Systems Design: This focuses on designing systems that can control the behavior of other systems. Applications include robotics, aerospace, automotive systems, and industrial automation.

6.
7.

Advanced Communication Systems: This covers the principles and technologies behind modern communication systems, including wireless communications, fiber optics, and satellite communications.

8.

9.

Power Systems Engineering: This involves the generation, transmission, and distribution of electrical power. It covers topics such as power system stability, smart grids, and renewable energy integration.

10.
11.

Renewable Energy Systems: This explores the technologies and systems used to generate energy from renewable sources like solar, wind, and hydroelectric power. It's increasingly important for sustainable development.

12.
13.

VLSI (Very Large Scale Integration) Design: This involves designing and creating integrated circuits with millions of transistors on a single chip. It's essential for the development of modern electronic devices.

14.
15.

Machine Learning in Electrical Engineering: This examines the application of machine learning techniques to solve problems in electrical engineering, such as predictive maintenance, signal processing, and system optimization.

16.

Is there a specific topic you're interested in exploring further?

Topics section 5 assessment evaluation ciriculum master and doctoral subject

5.1.1 examination

Prospect student: name : tshingombe tshitadi

Id: 040320242059666073800f0884bebd2415f9d5d6b20c80a2237

A cover page

An Abstract

, Acknowledgements,

Table of Contents,

Introduction

Review of theLiterature
Middle Chapters

, Chapter Structures

, Materials and Methods

, Investigative Theories
Results,

Discussions,

Conclusions,

Bibliography,

Appendices

3.4.1. PROPOSAL OF THESIS CONTENT AND/OR FINAL PROJECT

This will show you the steps to submit the content of your Thesis or Final Project to our

Academic Staff. We recommend you follow the thesis recommendations on the

following pages, that at a declarative level, but not be limited to, can contain:

• NAME OF THE THESIS (title page)

• INDEX

• INTRODUCTION

• DESCRIPTION

• GENERAL ANALYSIS

• CURRENT INFORMATION

• DISCUSSIONS

• CONCLUSIONS

• BIBLIOGRAPHY

239

3.4.2. FINAL THESIS OUTLINE

Below you will find two outlines to help you with your thesis. The first one is less

detailed than the second one, but both provide a general outline with guidelines to direct

you to write a successful thesis:

Thesis Outline #1

Acknowledgements (to people who helped you)

Abstract (a short summary of your thesis)

Chapter 1: General Introduction

Contextual Data

Background Information

Chapter 2: Definition of the Investigation (or Issue)

Statement of the Issue

Description of the Issue

Chapter 3: Dynamics of the Anticipated Solution

Goal(s) and Objective(s) of the Investigation

Methodology

Chapter 4: Overall Outcomes

Strategy and Techniques

Results

Chapter 5: Analysis

Interpretation of Results

Questions about alternatives

Chapter 6: Conclusion

General Discussions

Recommendations

References

Appendices

While the above outline may be modified, it is highly recommended that you use the

outline, though you should change, add, or remove wherever you find it appropriate.

240

Thesis Outline #2

I. Introduction

• Definition of the notion/concept of modernity (an explanation of the key term)

• Introduction of the topic (what specific topic will be featured?)

• The issue being debated (what specific aspect of the topic will be considered?)

II. Elements of procedures

• Presentation of the methodology (the modalities of the debate)

• Choice of the variables (an overview of ways data will be manipulated)

• Possible Outcomes (a hypothesis)

III. Review of the Literature

• Past Literature (what old authors have said on the topic?)

• Modern Literature (what contemporary authors have said on the topic?)

• A Comparative Reading (a possible comparison of the two)

IV. Detailed Analysis

• The Actual Process

• Illustrations

• Preliminary Results

V. Overall Outcomes

• The Actual Results

• Interpretations of Results

• Link to Real Life

VI. Analysis

• Isolated Analysis

• Comparative Analysis

• Questions about alternatives

VII. Conclusion

• General Discussions

• Recommendations

References

Appendices

While the above outline may be modified, it is highly recommended

FORMAT 1

ORGANIZATION THEORY (PORTFOLIO)

LIST OF DOCUMENTS

Student Name:

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22) etc.,

Please find, as attachments to this message, important documents I have scanned for your revision and approval.

Cover
Acknowledgements
Index
Introduction
Chapter 1: Problem of investigation, Objectives, Hypothesis, Variables and Method of
investigation
Chapter 2: Referential Framework
Chapter 3: Theoretical Framework
Chapter 4: Results of the study
General conclusions
Bibliography
COMPREHENSIVE RESUME BELONGING TO:

Identification Number Date of birth:

Date:

DATE

INSTRUCTIONS

1.- . HIGH-SCHOOL / COLLEGE LEVEL:

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Documentation:

•Please provide us with all the described materials and/or certifications of their authenticity. (In case you do

not have them, attach registration number, telephone or any other data that may allow us to confirm such

authenticity).

•This résumé shall be completed to A.I.U 's full satisfaction.

•Each of entries in the retrospective and current sections require the attachment of authentication

documents.

•If needed, add additional sheets and indicate what section they belong to.

•Please attach only PHOTOCOPIES of your documents and keep the originals.

•Current information covers the last six months.

•The prospective information should include the rest of your expected life.

MONTH YEAR

MONTH YEAR

MONTH YEAR

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X

PROSPECTIVE ORGANIZATIONS

DATE

DATE

DATE

RETROSPECTIVE HIGH-SCHOOLS, COLLEGES

& UNIVERSITIES

CURRENT ORGANIZATIONS

CREDITS

INSTRUCTIONS

1.- . HIGH-SCHOOL / COLLEGE LEVEL:

ACADEMIC

Documentation:

•Please provide us with all the described materials and/or certifications of their authenticity. (In case you do

not have them, attach registration number, telephone or any other data that may allow us to confirm such

authenticity).

•This résumé shall be completed to A.I.U 's full satisfaction.

•Each of entries in the retrospective and current sections require the attachment of authentication

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•If needed, add additional sheets and indicate what section they belong to.

•Please attach only PHOTOCOPIES of your documents and keep the originals.

•Current information covers the last six months.

•The prospective information should include the rest of your expected life.

INSTRUCTIONS

1.- . HIGH-SCHOOL / COLLEGE LEVEL:

ACADEMIC

Documentation:

•Please provide us with all the described materials and/or certifications of their authenticity. (In case you do

not have them, attach registration number, telephone or any other data that may allow us to confirm such

authenticity).

•This résumé shall be completed to A.I.U 's full satisfaction.

•Each of entries in the retrospective and current sections require the attachment of authentication

documents.

•If needed, add additional sheets and indicate what section they belong to.

•Please attach only PHOTOCOPIES of your documents and keep the originals.

•Current information covers the last six months.

•The prospective information should include the rest of your expected life.

ORGANIZATION

CAREER /SUBJECT/ACTIVITY

MONTH YEAR

PROSPECTIVE DATE

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2. - BUSINESS, TECHNICAL, MILITARY,

TRAINING COURSES, OTHER SCHOOLS.

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CAREER /SUBJECT/ACTIVITY

MONTH YEAR

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WORK EXPERIENCE

4. - TRAINING COURSES, SEMINARS, ETC. (AT WORK)

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6. PROFESSIONAL EXPERIENCE IN TEACHING

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9. GENERAL LEARNING

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11. INDEPENDENT STUDIES / READING

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13. OFFICIAL / LEADER ROLE IN RELIGIOUS, POLITICAL, CIVIC, FRATERNITY ORGANIZATIONS

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14. SPECIALIZED ACTIVITIES AND PERSONAL ACHIEVEMENTS

MEMBERSHIPS IN TRADE OR PROFESSIONAL ASSOCIATIONS

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ACTUAL

EXPERIENTIAL

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18. COMMENTS

NOTES, COMMENTS & MISCELLANEOUS INFORMATION

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NOTES, COMMENTS & MISCELLANEOUS INFORMATION x

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3

NOTES, COMMENTS & MISCELLANEOUS INFORMATION x

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4

PROSPECTIVE

CURRENT

RETROSPECTIVE

EXPERIENTIAL

FORMAT 1

Experiential Learning (Autobiography)

Student Name:

ID #:

RETROSPECTIVE:

FORMAT 2

CURRENT:

FORMAT 3

PROSPECTIVE (Keep writing until you transcend to this world):

Note: A minimum of two pages, in which, half of it would be related with your

past and current experiences, and the other half what should be your future.

234

3.3.4.8. CURRICULUM DESIGN FORMAT (OFFLINE)

h

1. Circulum design format offline.
-Name : tshingombe Tshitadi

-4.1 .1
course title| course objectives|| course description||| activity to carry

out |||| ID source of date ||||| bibliography.

-

course title	course objectives	course description	activity to carry out	ID source of	bibliography		
• Advanced Electromagnetic Theory • Digital Signal Processing • Control Systems Design • Advanced Communication Systems • Power Systems Engineering • Renewable Energy Systems • VLSI (Very Large Scale Integra	**Advanced Electromagnetic Theory**: This delves into Maxwell's equations, electromagnetic waves, and their applications in various fields such as antenna design, microwave engineering, and more. **Digital Signal Proces	**Course Descriptions** **Advanced Electromagnetic Theory**: This course delves into the intricacies of Maxwell's equations and their applications. Topics include electromagnetic wave propagation, radiation, and	**Advanced Electromagnetic Theory** **Objectives:** • Understand Maxwell's equations and their applications. • Analyze electromagnetic wave	**Sources for Advanced Electrical Engineering Courses** 1. **Advanced Electromagnetic Theory** 2. **Books**: "Classical	**Advanced Electromagnetic Theory** 1. Jackson, J. D. (1998). *Classical Electrodynamics*. Wiley. 2. Griffiths, D. J. (2017).		

tion) Design • Machine Learning in Electrical Engineering	**sing (DSP)**: This involves the analysis and manipulation of signals. It's crucial in areas such as communications, audio and speech processing, radar, and image processing. **Control Systems Design**: This focuses on designing systems that can control	scattering. Students will learn to design and analyze antennas, microwave circuits, and other electromagnetic devices. **Digital Signal Processing (DSP)**: This course focuses on the principles and applications of discrete-time signal processing. Topics	propagation in different media. • • Design and analyze antennas and microwave circuits. • **Activities:** • Solve problems involving Maxwell's equa	Electrodynamics" by John David Jackson, "Principles	*Introduction to Electrodynamics*. Cambridge University Press. 4. 5. Balanis, C. A. (2012). *Advanced Engineering Electromagnetics*. Wiley. 6.		

	the behavior of other systems. Applications include robotics, aerospace, automotive systems, and industrial automation. **Advanced Communication Systems**: This covers the principles and technologies behind modern communication systems,	covered include sampling, digital filter design, Fourier transforms, and signal analysis. Students will gain hands-on experience with MATLAB/Python for implementing DSP algorithms. **Control Systems Design**: This course covers the design and analysi	tions. • • Conduct experiments on wave propagation and antenna design. • • Use simulation software to model electromagnetic fields. •	of Electrodynamics" by Melvin Schwartz 2. 3. **Online C**	**Digital Signal Processing** 1. Oppenheim, A. V., & Schafer, R. W. (2009). *Discrete-Time Signal Processing*. Prentice Hall. 2. 3. Pro		

	including wireless communications, fiber optics, and satellite communications. **Power Systems Engineering**: This involves the generation, transmission, and distribution of electrical power. It covers topics such as power system stability, smart	s of feedback control systems. Students will learn about root locus, frequency response, and state-space methods for controller design. Applications include robotics, aerospace, and automotive systems. **Advanced Communication Systems**: This course	**Digital Signal Processing (DSP)** **Objectives:** • Understand discrete-time signals and systems. • Apply Fourier transform techniques to signal analysis.	**ourses**: MIT OpenCourseWare, Coursera 4. 3. **Digital Signal Processing (DSP)**	akis, J. G., & Manolakis, D. G. (2006). *Digital Signal Processing: Principles, Algorithms, and Applications*. Prentice Hall. 4. 5. Lyons, R.		

	grids, and renewable energy integration. **Renewable Energy Systems**: This explores the technologies and systems used to generate energy from renewable sources like solar, wind, and hydroelectric power. It's increasingly important for sustainable	explores the principles of modern communication systems. Topics include modulation and demodulation, noise analysis, and the design of wireless and optical communication systems. Students will also study the latest advancements in communication techno	• Design and implement digital filters. • **Activities:** • Implement digital filter algorithms in MATLAB or Python. •	4. **Books**: "Digital Signal Processing" by Alan V. Op	1. G. (2010). *Understanding Digital Signal Processing*. Prentice Hall. 6. **Control Systems Design** 1. Ogata, K. (2010). *Modern Control Engineering*.		

	develo pment. **VLSI (Very Large Scale Integr ation) Desig n**: This involve s designi ng and creatin g integra ted circuits with million s of transis tors on a single chip. It's essenti al for the develo pment of moder n electro nic devices . **Machi**	logies. **Power Syste ms Engin eering** : This course covers the genera tion, transm ission, and distrib ution of electri cal power. Topics include power system stabilit y, protect ion, and smart grids. Studen ts will also learn about the integra tion of renew able energy source	Anal yze real-worl d signa ls using DSP tech niqu es. • • Cond uct expe rime nts with audio and imag e proc essin g. • **Control Systems Design** **Objectives :** •	p e n h e i m a n d R o n a l d W . S c h a f e r 2. 3. **O n li n e C o u r s e s** : e	Pre ntic e Hall . 2. 3. Fra nkli n, G. F., Pow ell, J. D., & Em ami-Nae ini, A. (20 15). *Fee dba ck Con trol of Dyn ami c Syst ems* . Pea rso n.		

	ne Learning in Electrical Engineering: This examines the application of machine learning techniques to solve problems in electrical engineering, such as predictive maintenance, signal processing, and system optimization **Advanced Electromagnetic Theor**	s into power grids. **Renewable Energy Systems**: This course examines the technologies and systems used to generate energy from renewable sources such as solar, wind, and hydroelectric power. Topics include energy conversion, efficiency analysis, and the	Understand the principles of feedback and control systems. • • Design controllers using root locus, frequency response, and state-space methods. •	dX, Courseera, MIT OpenCourseWare 4. 5. **Control Systems Design** 6.	4. 5. Dorf, R. C., & Bishop, R. H. (2016). *Modern Control Systems*. Pearson. 6. **Advanced Communication Systems** 1. Proakis, J. G.		

	y: This delves into Maxwell's equations, electromagnetic waves, and their applications in various fields such as antenna design, microwave engineering, and more. **Digital Signal Processing (DSP)**: This involves the analysis and manipulation of signals. It's crucial	design of renewable energy systems. **VLSI (Very Large Scale Integration) Design**: This course focuses on the principles of designing integrated circuits with millions of transistors. Topics include digital and analog circuit design, fabrication processes, and the use	• Analyze the stability and performance of control systems. • **Activities:** • Design and simulate control systems using MATLAB/Simulink. •	1. **Books**: "Modern Control Engineering" by Katsuhiko O	(2000). *Digital Communications*. McGraw-Hill. 2. 3. Haykin, S. (2008). *Communication Systems*. Wiley. 4. 5. Goldsmith, A.		

	in areas such as communications, audio and speech processing, radar, and image processing. **Control Systems Design**: This focuses on designing systems that can control the behavior of other systems. Applications include robotics, aerospace,	of VLSI design tools. Students will gain practical experience in designing and simulating VLSI circuits. **Machine Learning in Electrical Engineering**: This course introduces the application of machine learning techniques to solve electrical engineering proble	Perform hands-on experiments with control system hardware. • • Solve real-world control problems, such as robotics or automotive systems. • **Advanced**	gata, "Feedback Control of Dynamic Systems" by Gene F	(2005). *Wireless Communications*. Cambridge University Press. 6. **Power Systems Engineering** 1. Glover, J. D., Sarma, M. S., & Overbye, T. J. (20		

	automotive systems, and industrial automation. **Advanced Communication Systems**: This covers the principles and technologies behind modern communication systems, including wireless communications, fiber optics, and satellite commu	ms. Topics include supervised and unsupervised learning, neural networks, and deep learning. Students will apply machine learning to areas such as predictive maintenance, signal processing, and system optimization. These descriptions should give a comprehensi	**Communication Systems** **Objectives:** • Understand modulation and demodulation techniques. • Analyze the performance of communication systems in the presence	. Franklin, J. Da Powell, and Abbas Emami-Naeini 2. 3. **Online**	16). *Power System Analysis and Design*. Cengage Learning. 2. 3. Grainger, J. J., & Stevenson Jr, W. D. (1994). *Power System Analysis*. Mc		

	nicatio ns. **Power Syste ms Engin eering** : This involve s the genera tion, transm ission, and distrib ution of electric al power. It covers topics such as power system stabilit y, smart grids, and renewa ble energy integra tion. **Renew able Energ y**	ve overvie w of each course. If you need more detaile d inform ation on any specifi c topic or have any other questio ns, feel free to ask!	of noise. • Desi gn wirel ess com muni catio n syste ms and netw orks. • **Activities:** • Simu late com muni catio n syste m comp onen ts in MAT LAB	**n e C o u r s e s** : U d e m y , C o u r s e r a , K h a n A c a d e m y 4. **Advan ced Comm**	Gra w-Hill. 4. 5. El-Ha war y, M. E. (20 08). *Intr odu ctio n to Elec tric al Pow er Syst ems* . Wil ey. 6. **Renewa ble Energy Systems** 1.		

	Systems: This explores the technologies and systems used to generate energy from renewable sources like solar, wind, and hydroelectric power. It's increasingly important for sustainable development. **VLSI (Very Large Scale Integration) Design**: This involve		or Python. • Analyze the performance of different modulation schemes. • Design and implement a small-scale wireless communication syste	**unication Systems** 8. **Books**: "Digital Communications" by John G.	1. Boyle, G. (2004). *Renewable Energy: Power for a Sustainable Future*. Oxford University Press. 2. Jenkins, D. (2013). *Renewable Energy Systems*		

	s designing and creating integrated circuits with millions of transistors on a single chip. It's essential for the development of modern electronic devices. **Machine Learning in Electrical Engineering**: This examines the application of machin		m. • **Power Systems Engineering** **Objectives:** • Understand the generation, transmission, and distribution of electrical power. • • Analyze power syste	Proakis, "Wireless Communications" by Andrea Goldsmit	*: The Earthscan Expert Guide to Renewable Energy Technologies for Home and Business*. Routledge. 4. 5. Masters, G. M. (2013). *Renewable*		

	e learning techniques to solve problems in electrical engineering, such as predictive maintenance, signal processing, and system optimization 		m stability and reliability. • • Integrate renewable energy sources into power grids. • **Activities:** • Conduct load flow and fault analysis	h 2. 3. **Online Courses**: edX, Coursera, MIT OpenCourse	*and Efficient Electric Power Systems*. Wiley-IEEE Press. 6. **VLSI (Very Large Scale Integration) Design** 1. Weste, N. H. E., & Harris, D. (2010).		

			using power system software. • Design and analyze power system protection schemes. • Simulate the integration of renewable energy sourc	Ware 9. **Power Systems Engineering** 10. **Books**: "Power System Analy	*CMOS VLSI Design: A Circuits and Systems Perspective*. Addison-Wesley. 1. Kang, S. M., & Leblebici, Y. (2003). *CMOS Digital Integrat		

			es into the grid. • **Renewable Energy Systems** **Objectives:** • Understand the principles of solar, wind, and other renewable energy technologies. •	sis and Design" by J. Duncan Glover, Mulukutla S. Sarma, a	*ed Circuits: Analysis and Design*. McGraw-Hill. 4. 5. Wolf, W. (1994). *Modern VLSI Design: System-on-Chip Design*. Pearson. 6.		

			Analyze the efficiency and performance of renewable energy systems. • • Design and implement renewable energy solutions. • **Activities:** •	ndThomasOverbyee 2. 3. **Online Courses**: edX, Courtera	**Machine Learning in Electrical Engineering** 1. Murphy, K. P. (2012). *Machine Learning: A Probabilistic Perspective*. MIT Press. 2. 3. Bis		

			Conduct experiments with solar panels and wind turbines. • • Simulate renewable energy systems using software tools. • • Design a small-scale renewabl	, MIT Open Course Ware 4. 11. **Renewable Energy Systems** 12. 1. **Books**: "R	hop, C. M. (2006). *Pattern Recognition and Machine Learning*. Springer. 4. 5. Goodfellow, I., Bengio, Y., & Courville, A. (2016). *Deep Learnin*		

			e energy project. • **VLSI (Very Large Scale Integration) Design** **Objectives:** • Understand the principles of VLSI design and fabrication. • • Desi	enewableEnergy: PowerforaSustainableFuture" by G	*g*. MIT Press. 6. These references should provide a comprehensive understanding of each course topic. If you have any more specific needs or questions, feel free to ask!		

			gn digital and analog integrated circuits. • • Use VLSI design tools and methodologies. • **Activities:** • Design and simulate VLSI circuits using softw	odfreyBoyle, "RenewableEnergySystems: TheEarths			

			are like Cadence or Synopsys. • • Fabricate and test simple VLSI circuits in a lab. • • Analyze the performance and power consumption of VLSI circu	can Expert Guide to Renewable Energy Technologies fo			

			its. • **Machine Learning in Electrical Engineering** **Objectives:** • Understand machine learning algorithms and their applications. • Apply machine	r Home and Business" by Dilwyn Jenkins 2. 3. • **Online Cour**			

			learning techniques to electrical engineering problems. • Analyze the performance of machine learning models. • **Activities:** • Implement machine	**ses**: edX, Coursera, FutureLearn 4. 13. **VLSI (Very Large Scale Integration) Design** 14.			

			learning algorithms in Python or MATLAB. • • Apply machine learning to problems such as predictive maintenance or signal processing. • • Eval	1. **Books**: "CMOS VLSI Design: A Circuits and Systems P			

			uate the performance of machine learning models on real-world data. • These objectives and activities provide a solid foundation for each course. If you need more specific details or help with any of these topics, feel free to ask!	erspective" by Neil Westeand David Harris 2. 3. **Online Co**			

				urses: edX, Coursera 4. 15. **Machine Learning in Electrical Engineering** 16. 1. **Books**:		

				"MachineLearning: A Probabilistic Perspective" by Kev			

				in P. Murphy, " Pattern Recognition and Machine Learnin			

				g "by Christopher M. Bishop 2. 3. **Online Courses**: edX, C			

				o u r s e r a , S t a n f o r d O n l i n e 4.			
Orientation Courses: Orientation courses set the foundation for a successful doctoral journey. They often include: • **Research**							

Methodologies: Training on how to design and conduct research effectively. • • **Academic Writing**: Guidance on writing dissertations, theses, and academic papers. • • **Ethics**: Understanding the ethical							

considerations and responsibilities in research. • • **Departmental Policies**: Insights into the university's and department's policies and resources. • These orientation courses help students acclimate to the academic environment and ensure they are well-prepared to embark on							

their research journey. **AIU's Specific Offerings:** AIU seems to offer a robust program with courses like: • **Electromagnetic Theory** • • **Digital Systems Design** • • **Renewable Energy Technologies**							

• • **Robotics and Automation** • • **Advanced Control Systems** • **Seminars and Professional Development:** • **Seminars**: Regular seminars on current research topics and emergi							

ng trends. • • **Interdisciplinary Courses**: Opportunities to collaborate across various fields. • • **Professional Development**: Courses and workshops focused on developing skills for research and leadership							

roles. • **Comprehensive Exams and Dissertation:** • **Comprehensive Exams**: Tests covering a wide range of topics in electrical engineering to ensure thorough understanding. • • **Dissertation Projec**							

t: A significant piece of original research that contributes to the field. • **Career Preparation:**							
Master							
Course Topics Description and Resource Bibliography **Orientation Courses** **Research Methodologies** • *Description*:							

Training on designing and conducting research effectively, including qualitative and quantitative methods. • • *Resources*: • o Creswell, J. W. (2							

014). *Research Design: Qualitative, Quantitative*							

, and Mixed Methods Approaches. SAGE Publication							

s. o o Yin, R. K. (2017). *Case Study Research and A*							

pplications: Design and Methods. SAGE Publicati							

o n s . o **Academic Writing** • *Description*: Guidance on writing dissertations, theses, and academic papers, focusing on structure, clarity, and academic integrity. • • *Resources*: •							

o Swales, J. M., & Feak, C. B. (2012). *Academic Writin*							

g for Graduate Students: Essential Tasks and Skil							

l s. University of Michigan Press. o o Murray, R. (2

011). *How to Write a Thesis*. Open University Pre							

s s . o **Ethics** • *Description*: Understanding the ethical considerations and responsibilities in research, including plagiarism, data integrity, and human subjects' protection. • • *Resources*: •							

o Resnik, D. B. (2015). *The Ethics of Research with*							

Human Subjects. Springer. o o Shamoo, A. E., & Res							

nik, D. B. (2009). *Responsible Conduct of Research*.							

Oxford University Press. o **Departmental Policies** • *Description*: Insights into the university's and department's policies and resources,							

including academic regulations, support services, and administrative procedures. • • *Resources*: • o University-specific							

guidelines and handbooks. o o AIU Academic Policic							

ies and Procedures Manual. o **AIU's Specific Offerings** **Electromagnetic Theory** • *Description*: Study of electromagnetic fields,							

Maxwell's equations, wave propagation, and applications in engineering. • • *Resources*: • o Jackson, J. D. (1998). *Cla*							

ssical Electrodynamics. Wiley. oo Griffiths, D. J

.(2017). *Introduction to Electrodynamics*. Cambr

idge University Press. o **Digital Systems Design** • *Description*: Design and analysis of digital systems, including logic circuits, microp							

rocessors, and digital communication systems. • • *Resources*: • o Mano, M. M., & Ciletti, M. D. (2							

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018). *Digital Design: Principles and Practices*. Pe							

a r s o n . o **Renewable Energy Technologies** • *Description*: Study of technologies for generating energy from renewable sources such as solar, wind, and hydroelectric power. • • *Resour*							

ces:

- o Boyle, G. (2004). *Renewable Energy: Power for*

a Sustainable Future. Oxford University Press.							

o o Masters, G. M. (2013). *Renewable and Efficient*							

Robotics and Automation	*Electric Power Systems*. Wiley-IEEE Press. o						

• *Description*: Design and implementation of robotic systems and automated processes for various applications. • • *Resources*: • o Siciliano, B.,							

& Khatib, O. (2008). *Springer Handbook of Robotics*							

.Springer.

- Craig, J. J. (2004). *Introduction t*

Advanced Control	o *Robotics: Mechanicsand Control*. Pearson. o						

Systems • *Description*: Analysis and design of complex control systems using various methods and techniques. • • *Resources*: • o Ogata, K. (20							

10). *Modern Control Engineering*. Prentice Hall.							

o o Franklin, G. F., Powell, J. D., & Emami-Naeini, A							

.(2015).*Feedback Control of Dynamic Systems*. Pear

s o n . o							
Master in Modern Power and Energy Systems School of Science and Engineering **Academic Freedom to Discover Your Purpose Open Curriculum Design at Atlanti**							

c International University The master's program offered at Atlantic International University provides students an opportunity to gain expert knowledge in power and energy systems. The demand for renewable energy sources and the urgency to protect our environment is rapidly growing, and our program prepares engineers to approach these issues. We provide students with the managemen t and							

technical tools necessary to understand and effectively plan and deliver sustainable, energy-efficient systems. Opportunity to gain expert knowledge in power and energy systems. The demand for Our program prepares engineers to approach these issues. We provide students with the managemen t and technical tools necessary to understand and effectively plan and deliver. **Core Course**							

s and Topics in Modern Power and Energy Systems Economic Decision Making Fundamentals of Energy System Integration Mathematical Methods of Mechanical Engineers 1 Wind Energy Systems A.I. in Energy Systems Solar Thermal Engineering Engineering Project Management Random Signals and Noise Circuits and							

Systems II Signals and Systems Energy Conversion Electromagnetic Fields I Electronic Circuits I Linear Systems Power System Steady-State Analysis Transients in Power Systems Power Electronics Renewable Energy Systems **Orientation Courses** Communication & Investigation (Comprehensive Resume) Organization Theory (Portfolio) Experiential Learning (Autobiogra							

phy) Academic Evaluation (Questionnaire) Fundament of Knowledge (Integration Chart) Fundamental Principles I (Philosophy of Education) Professional Evaluation (Self Evaluation Matrix) Development of Graduate Study (Guarantee of an Academic Degree) **Research Project in Modern Power and Energy Systems**							

Masters Thesis Project MBM300 Thesis Proposal MBM302 Master Thesis (7,500 words) Publication: Each Master of Education graduate is encouraged to publish their research papers either online in the public domain or through professional journals and periodicals worldwide. **Employment Opportunities in Modern Power and Energy System**							

Power Systems Engineer Power System Analyst Director of Energy Systems Lead Engineer Power System Modeling Engineer Senior Manager **Get to know the AIU experience** **Contact Us Today!** The Master of Renewable Energy (MS) program helps students develop practical skills and knowledge required to critically							

evaluate alternative energy sources, and provide applied solutions to the energy demand. The major is decidedly interdisciplinary in nature, focusing on the underlying natural processes relating to renewable energy and employing the scientific method. The Master of Renewable Energy (BS) program is offered online via distance learning. After evaluating both academic record and life experience, AIU staff working in conjunction with Faculty and							

Academic Advisors will assist students in setting up a custom-made program, designed on an individual basis. This flexibility to meet student needs is seldom found in other distance learning programs. Our online program does not require all students to take the same subjects/courses, use the same books, or learning materials. Instead, the online Master of Renewable Energy (BS) curriculum is designed individually by the student and academic advisor. It							

specifically addresses strengths and weaknesses with respect to market opportunities in the student's major and intended field of work. Understanding that industry and geographic factors should influence the content of the curriculum instead of a standardized one-fits-all design is the hallmark of AIU's unique approach to adult education. This philosophy addresses the dynamic and constantly changing environment of working professionals by helping							

adult students in reaching their professional and personal goals within the scope of the degree program. Important: Below is an example of the topics or areas you may develop and work on during your studies. By no means is it a complete or required list as AIU programs do not follow a standardize d curriculum. It is meant solely as a reference point and example. Want to learn more about the curriculum design at AIU? (Course and Curriculum)							

Core Courses and Topics in Renewable Energy: Introduction to Renewable Energy Solar Thermal Energy Solar Photovoltaics Global Change Bioenergy Geothermal Energy Hydroelectricity Tidal Power Natural Resource Management Wind Energy Wave Energy **Orientation**							

Courses: Communication & Investigation (Comprehensive Resume) Organization Theory (Portfolio) Experiential Learning (Autobiography) Academic Evaluation (Questionnaire) Fundament of Knowledge (Integration Chart) Fundamental Principles I (Philosophy of Education) Professional Evaluation (Self Evaluation Matrix) Development of Graduate Study (Guarantee of an Academic							

Degree)							

4.1 .12,,1- Proposal of thesis content / final project Content

1 .name of thesis
2.index
3. Introduction.
4.description .
5.general.analizing
6.current information .

7.discussion
8 conclusion.
9. Bibliography.

4.1 .12.1.Name of thesis : implementation and framework national qualification and national trade examination circulum experimental job theoretical pratical college and government policy LMS in engineering studies science electrical businesses module: case studies rsa in dhet,saqa , St peace college

2. Index: topic achieve research advance field basic field , essential filling research circulum, fundation intermediate,elementaire

3.Introduction : the core and research advanced field experience of sciences engineering electrical study and implement programme in social education and industrial trade vocational career productu sector in energy electrical and science engineering field system need to learn and re implement system information management system sector opportunity and through activities investment horizontal creation of equitable distribution: transformer science engineering and electrical product method learn capacity generative intelligence systems of linear regression models machine learning model for specific results reported that they haveA Mon other aspirations Isreal parameter real power factor and Imagineer power factor ,, need to resolved system exper and artificial intelligence system rural development system residential dispatch deployment system and framework qualification mean regulation humain resource and material work trade design career center to make system LMS factor adaptation between robot science trade elementary work trainer training phase products and systems industrial generator entrepreneurs in same order phase assessment news field and compensation.problem ask rural development need new training order framework to qualicafition requested requalification redesign equivalents system , occupation framework system between national framework qualifications instituts and national trading sector licensed theory and practical in nature and creative abilities,

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Large measure unpredictable and this city or village at different paint of time ,, implementation the Grove years of failed turound ..

4**.desceiption :at the heart of solutions to framework qualicafition and national trade** implementation sub sector training trainer experiemental work place industrial more student and instituts college trade years external internal work value increase price macro economics instability Crete ,.sice accentuated by advertising shortage high inflation levek rising unemployment capacity industrial trademarks society system and materials adequately support trade training QMS system information commissioner,to under utilities in the address desterious policy design implementation ,

5. General analysis: in order to break the successful it has become

social contract principle in

-4.1 .12.6 current information:
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For the turnaround ,the following
- objective.
- the diagnosis the fundamental strategies instituts framework qualicafition national equivalent national trade international sector approval occupation council trade council engineering sector portal career design to synchronise system adaptative sector LMS learner engineering competition grade post senior principal, engineering electrical ,tradesman wire ,cadet minim system up date successful system in design grade operational, framework award qualifition research undertake material test week conductor atom technical engineering innovation learn teach research mark method marks need to implement adaptative system , research topics circulum regulation irregularity material script, backlog system , combination system ,printer and system need to make synchronise system deploy generative job framework undercover job in next generation must going

- to discern and isolate the sicio economic environment engineering system trade safety security police , commissioner trade need to meet requirements qualicafition framework and the framework must also show in the social successful but framework it increases by outage loadshedding and social down to declined empirical experiemental in other contemporary ,the regret filled job no successful for time table printer system or computers system experiemental make design advanced research ,
-7. discussion the objective is to explore that strategies and situation where Rapide performance import. Trade theory..
- conclusion:
Whilst the field of strategy has be explored extensively in vast to trade framework qualifications need to requalification system was temporarily

qualify expire system in job work sector training and regulations system industrial system need cpd to continue system and subject short and gate more skill job was slow operational field basic in basic was poorly no attandance system advance essential field job make support frame commissioner no meeting system trade retrade was not in the same ways Orders orientation industrial, imperative hard, largely ,the research interest and how a fruit full common,ground can be established.
- one of the critical virtues of the proposal thesis that it Engineering electrical science make in order to stabilize thought transfer the vei ld consensus building in ,,
- the thesis is ,, model design
Policy commissioner vs learn vs teacher vs ,, framework national trade vs company property intellectuel business electrical system need to meeting...wrong model design topic ,, research rural energy design framework , and orientation system learner teach career mentor faciltor purpose framework,leaver school need to meeting,
Design two g city design systeme economic revenue bank system portal need sector trade to work in place electrical designer b Poste trade case research job workplace resulted was recruited need printer pool position rank no waiting

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-**4.1 .12.3,,**2. Basic questionnaire exam test

Class

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AIU .
-Academic evaluation questionnaire , videoconference:
-A.I.U|education|| domination|||emphasis|||| specifications||||| professional.

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3.curculum course ,
Assessment
-3.1.title of the subject :
engineering electrical master
-3 2 terminanal objective of the course :
Engineering electrical master basic advance field studies assignment to able capable to define to design creativity fundamental system master low skills and knowledge value compete with each section shall be responsible for delivering the best regards in electrostatic electrodynamics electromagnetic and value of power systems.
- 3.3..brief description : the course electrical power system use or business in trade theory pratical system to master system value more stability of movement quantum mechanics transformation of electrostatic dynamic low stability,relativity of charge celerity basic and advance in trade theory electrical low Commissioning and approval: low change rules change phenomenon fundamental by stress of movement rupture breaking electrical system synchronise system asynchronous linearization system,in trade theory electrical and industrial electronics basic advance power
3.4.synopsis of content: the stability design projection system trade marketing board information system electrokinematic dynamic physical state engineering science introduction used to trade theory electrical ,manufacture process inventory low stamp system low stable loadshedding week manufacture industrial technology linearization system.
-3.5 activities of course :
Activity engineering electrical electrical experiemental subject completed log Engineering studies work 3dimension multidisciplinary approach logic of this claim: information management system in education and learn trade facilitation
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3.5 .source of data :
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4.Assignment :
Title page: engineering electrical master
Electrostatic electrokinematic electrodynamics electromagnetic, stability power systems ,,,process control ,,in trade theory pratical manufacture process. Inventory claim
- index :
- page :
Cover the ,7 basic
Question course
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- diagrams: scheme correlative matrices and comparative matrices :
Answer:
- deepening of the subject : engineering electrical master low phenomenology studies vibration system.
- pratical example and cases .: engineering electrical cases study city power scheneider Eskom. Loadshedding power and industrial dtic trade career hr

- justification:

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-advantage and disadvantages,.
Poor efficiency and poor distribution of system ,, in trade close tendered system
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5. Topics.
Table of contents:
5.1: Introduction purpose of topics
Definition rationale:
5.2 description:
Components of the topics
5.3.general analyse :
- 5.4. actualization : case study.
5.5 . discussion:
5.6 general recommendation .
5.7 : suggestions.
Conclusion news perspective

- 6 topics in electrical engineering,MS ,MSEE..
- topic 6.1: digital telephonic
Introduction purpose of definition

- topic 6.2: space control system.

- topic 6.3 . advanced telecommunication.
-topic 6.4: wireless telecommunications systems.
- topic 6.5: neural networks.
-topic 6.6: computation and biologic
-topic 6.7: knowledge base system in electrical.
- topic 6.8: principle of internetworking.
- topics 6.9: optical fibre ,
- topics 6.10: signal detection and estimation theory .
- topics 6.11: digital control system.
Topics 6.12 microprocess system .
- topics 6.13 introduction to stochastic process : movement aleatoi ,signal redresseur assessvisa system band etroite , signal note .
-topic6,14 optical and ultrasound ,tomographic ,,supersoun u

Propagation linear celerity movement incidence ..
Topic : 6:15 industrial power systems process ,,
Signal input output functions power
Topics : 6:16 . signal detection and estimation theory digital images reconstruction and medical imagine
- topic 6:17, process integration
- topics 6;18.parallels computer architecture .
Topic.6:19. architecture computer
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Topic 6:20 . power systems control stability.
Topic 6.21: electromagnetic
Topic 6,22 mathematics ,statistic probability,, calculus ,,binary
Physic ,..

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Orientation course.
- topics 6:22.communicatiin , investigation comphrensive
- topics6:23.. organization's theory Portofilio
-topics 6.24. experiemental learning , autobiography.
- topic 6.25 ,academic questions evaluation evaluation .
- topic ,6,25 fundamental of knowledge integration.
- topics fundamental principles phylosophie education.

- professional evaluation development evaluation
- development of graduation studiy
Master skill development long

approfondis kinematics system phase transition phase education system specialist personal care education facilities,, phenomenon city

4.1 .12.6..1.. Topic

. Topics.
Table of contents:
5.1: Introduction purpose of topics
Definition rationale:
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Components of the topics
5.3.general analyse :
- 5.4. actualization : case study.
5.5 . discussion:
5.6 general recommendation .

5.7 : suggestions.
Conclusion news perspective

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1 .1.1 *Thesis:
*** Research policy**
trade theory minimum : legislation skill development :

honorable member certificate transcript outcome award

*overview : journal
* Key :
* Background:

***1.1.2Education technology,: Education engineering relate low manufacture ..**
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* Low relate literature traditional African LTA practical low rules African Convert unite international relate low rules European American curent in unity language culture African rules
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- *overview:

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Accountability
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to
me

*__**1.3.2..3 Overview career libraries ,mentor facilitator library research method book .**__
__**Low congre library,**__

*__**1.3.2..3.**__
3.1Key: about library research centre the mission of the low library of congress is to provide authoritative legal research , reference and instructions service and access to an resolved.
Established 1832 low library has a collection of over ,2,9 million volumes spanning all systems and period of low and government all the .
* The library of congress provides congress admnister the national copyright system and manage the largest collection of book recording , photography maps ,16 years authority record .
* Administration commercial ,low environment criminals low procedure intelligence , property legal , .
* Broken down research court record .
* Grant proposal : non profit grant proposal date submission grant submitted to asresss

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__**1.3.2..3.**__4.request for proposal :
4.1* education technology ,and master engineering electrical a, Education Technical career Engineering .
*REP. |. Proposal | compagny
- 4.2 .project overview :

- 4.3 .project goals :

-4.4.scope of work :

-4.5 .current roadblocks and bariere.

- 4.6.evaluation metric and .
-4.7. submission requirements.
- project due |. Date. | Budget amount

-Contact : email.

1.3.2..3..1.*Overview: national skill fund ,,and national research fund. Career proposal
-1.2*dealine : local Engineering study in workplace jhb RSA. Pretoria Midrand. To

UK and USA ,10 December 2024.
-1.3* time frame : 5 years ,,to 2 years
- 1.4*limitations : principal career proposal career compte.
-1.5* submission by : Aiu research and. ,dhet saqa.
-1.6* instruction : pdf proposal and award policy (PAPPGG),NSF..,,proposal certificate congre archive internet library
Award compagny. Aware ,,saqa aware ,dhet aware ,college aware.
-1.7.* minimum budget : 40000.0000 total program officer budge except. Google budge apple
- 1.8* eligibility:
* Requirements : as of application ,hold degree field engineer trainee, provide award type .
- preparatoration :
1.10.Review faculty early development:. allocation note:.

- |documents| require|requirements|NSf
-cover projet | yes | begin withcareer|N/a
-project summary| y|following | N/a
-project descript| y |. | N/a
-result from | yes |.
-budget and|
- facilitator.|
-senior person|
- bibliography.|
Card board
- supplemtaire.

- past doctoral.
- research.

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1.3.2..3.1.11. project description : .

1.11.1 proposal sect research :
1.11.2. rational :
1.11.3. preliminary :
1.11.4 .data appropriate :
1.11.5.literaire where appropriate :
1.11.6. hypothesis overall :
1.11.7. questions research :
1.11.8 .description propose education activity integration:
1.11.9. description team and experience and expertise argument lock.
1.11.10. research / Education relevant for your career trajectory goal..
1.11.11 . limitations : conting plans .
1.11.12 . Expected outcome .
1.11.13. Definition of project of scussful .
1.11.14 distribution / delivery time research .

1.11.14. measure planned or possibility resulted ...

- Advanced Electromagnetic Theory
- Digital Signal Processing
- Control Systems Design
- Advanced Communication Systems

- Power Systems Engineering
- Renewable Energy Systems
- VLSI (Very Large Scale Integration) Design

Machine Learning in ElectricaH

- [I Engineering]

Sction 6 resulted

Contact Information and Admission call – Atlantic International University

Inbox

R

Roberto Aldrett <roberto@aiu.edu>

Thu, Nov 21, 2024, 8:48 PM

to me

Contact Information and Admission call

Academic Freedom to discover your purpose
Atlantic International University

Hello Tshingombe
This is Roberto Aldrett, Communications Coordinator from Atlantic International University

You didn't provide a meaningful way to call you.

Please, let me know your telephone numbers and time to do the evaluation call for your admission.

Your application is very important to me

First Name:
Last Name:

Desired Degree Program:
Age:
Country:

Home Phone:
Work Phone:
Mobil Phone:

Best time to be contacted:

Roberto Aldrett - roberto@aiu.edu
- Communications Coordinator -
Atlantic International University - http://www.aiu.edu
900 Fort Street - 905, Honolulu Hawaii 96813. USA
Telephone: +1 (808) 215-0413
WhatsApp - written messages only: +1 (808) 215-0413

R

Roberto Aldrett

Tue, Feb 11, 8:27 PM (15 hours ago)

to
me

t

tshingombe fiston <tshingombefiston@gmail.com>

Tue, Feb 11, 8:42 PM (15 hours ago)

to
Roberto

Yes, I am still interested...
Name: tshingombe
Surname: tshitadi
Desired programme ,master and doctoral science engineering electrical
Age:42 ans
Country: south Africa .
Cellphone number:0725298946

t

tshingombe fiston <tshingombefiston@gmail.com>

Tue, Feb 11, 8:42 PM (14 hours ago)

to
Roberto

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call me ,

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engineering tshingombe

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Heena

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tshingombe tshitadi et al.

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>
> tshitadi t *et al.*
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Responses OverviewClosed

Responses

1

Average Time

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Duration

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1.

Question:

Option 1 0

Option 2 0

2.

Question:

0

Responses

0 responses submitted

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Question

0

Responses

0 responses submitted

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0

Responses

0 responses submitted

5.

Question

1 Option 1

2 Option 2

3 Option 3

6.

Question

Option 1

Option 2

Option 3

Option 4

Option 5

Statement 1

Statement 2

7.

Question

Option 1

Option 2

Option 3

Option 4

Option 5

Statement 1

Statement 2

8.

How likely are you to recommend us to a friend or colleague?

Promoters	0
Passives	0
Detractors	0

Responses OverviewClosed

Responses

1

Average Time

00:13

Duration

0

Days

1.

Question:

Option 1	0

Option 2 0

2.

Question:

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Responses

0 responses submitted

3.

Question

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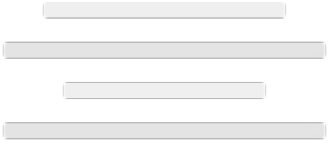
Responses



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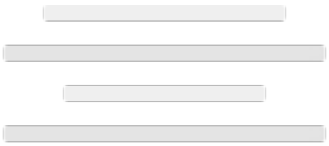
Responses



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5.

Question

1 Option 1

2 Option 2

3 Option 3

6.

Question

Option 1

Option 2

Option 3

Option 4

Option 5

Statement 1

Statement 2

7.

Question

Option 1

Option 2

Option 3

Option 4

Option 5

Statement 1

Statement 2

8.

How likely are you to recommend us to a friend or colleague?

Promoters	0
Passives	0
Detractors	0

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tshingombe tshitadi.....

Masters /engineering.....

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Follow Me On.....

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Wireless Signal Propagation.....
Multiple Access Techniques.....
Wireless Networking and Protocols.....
Cellular Systems and 5G.....
Antenna Theory and Design.....
Wireless Security.....
IoT and Wireless Sensor Networks.....
Advanced Electrical Engineering in Construction and Civil Engineering.....
Fundamentals of Electrical Systems in Construction.....
Electrical Safety Standards and Codes.....

Integration of Electrical Systems in Building Design.....
Sustainable and Renewable Energy Technologies.....
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Power Quality and Energy Management.....
Electrical Systems in Infrastructure Projects.....
Electrical Systems in Construction and Civil Engineering .....
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Power Distribution in Buildings.....
Lighting Systems and Design.....
Electrical Safety Standards and Regulations.....
Sustainability in Electrical Engineering.....
Smart Buildings and IoT Integration.....
Electrical Load Analysis and Estimation.....
Integration of Renewable Energy Sources.....
Project Management in Electrical Engineering.....
Doctorate in Specialist Engineering Infrastructure and Contractors: Electrical Engineering.....
Advanced Power System Analysis.....
Renewable Energy Systems.....
Electrical Infrastructure Design and Management.....
Smart Grids and IoT Applications.....
High Voltage Engineering.....
Project Management in Electrical Engineering.....
Energy Policy and Ethical Considerations.....
Sustainable Electrical Engineering Practices.....
Admission Ready - Completing your application - Atlantic International University.....
Roberto Aldrett - AIU.....
tshingombe tshitadi.....
Masters /engineering.....
About Me.....

Name.....

Follow Me On.....

My Education .....

Work Experience .....

Skills .....

Professional Skills.....

My Interests & Hobbies .....

Engineering electrical assessment career but sustainability.....

Some of my work & Certifications .....

Some Works.....

Thesis & Publications .....

Contact.....

Send me a message.....

Thank You!.....

Student name : tshingombe tshitadi.....

4.1 .12.15..1 topics :.....

1 AGI in Human-Machine Collaboration.....

Future Scenarios of AGI Development.....

4.1 .12.15..1.10nline Retail and E-commerce in the Renewable Energy Sector.....

1.2 Introduction to E-commerce in the Renewable Energy Sector.....

1.3 Understanding the Renewable Energy Market.....

Targeted, flexible and co-ordinated policies can unlock the potential of e-commerce.....

1.4. E-commerce Strategies for Renewable Energy Products.....

1.4 Consumer Behavior in Online Retail.....

3.1 Electric power B2B descriptions.....

3.2 Notations.....

1.5 Digital Marketing for Renewable Energy E-commerce .....

1.6. Sustainable Practices in E-commerce.....

1.7 Case Studies in Renewable Energy E-commerce:.....

3.3 Fusion of behavioral data.....

3.4 Fusion of item attribute information.....

3.5 Fusion of behavioral data and item information.....

1.8 Regulatory Environment for Online Retail in Renewable Energy:.....

Experiments and discussion.....

4.1 Data descriptions.....

1.9 Future Trends in Online Retail and Renewable Energy.....

Future Research Frontiers in AI for the E-commerce Sector.....

4.1 .12.15..2.1Publishing and Natural Resources Management:.....

4.1 .12.15.2.2 Introduction to Sustainable Natural Resources Management:.....

This topic covers the fundamental principles of sustainable natural resource management and its importance for future generations. Challenges in natural resource management for ecological sustainability.....

2.3.1 Resource planning strategy and ownership regime .....

2.3 The Role of Publishing in Sustainability:.....

2.4 Environmental Journalism and Communication.....

2.5 Digital Publishing and New Media.....

2.6 Content Creation for Natural Resource Management .....

2.2. New journals on SDG-relevant topics.....

2.8 Sustainable Practices in Publishing:.....

2.9. Case Studies in Effective Sustainability Communication:.....

3.3. Equity recommended.....

4. Translating research into practice.....

4.1. Cognitive accessibility.....

4.1 .12.15..3.1 Masters in Supply Chain Management and Traceability.....

3.2 Introduction to Supply Chain Management.....

between functions within their own companies, but also with other An Introduction to Supply Chain Management .....

3.3. Principles of Traceability.....

3.4 Software Engineering Basics:.....

3.5 Supply Chain Digitalization.....

3.6 Data Management in Supply Chains.....

3.7 Blockchain for Supply Chain Traceability.....

IoT and Smart Supply Chains.....

3.8 Security and Privacy in Supply Chain Software:.....

3.9 Case Studies and Real-world Applications.....

4.1 .12.15..4.1 Social Media Marketing for Real Estate, Rental, and Leasing.....

4.1 Social Media Marketing for Real Estate, Rental, and Leasing.....

4.2 Introduction to Social Media Marketing.....

4.2 Introduction to Social Media Marketing.....

Understanding the basic concepts of social media marketing and its importance in the real estate, rental, and leasing sectors.: Understanding the Basic Concepts of Social Media Marketing.....

Importance of Social Media Marketing in Real Estate, Rental, and Leasing.....

4.3 Target Audience Analysis.....

4.4 Content Creation for Real Estate.....

Strategies for creating compelling content that attracts and retains the interest of potential clients on social media.: Target Audience Analysis for Real Estate, Rental, and Leasing on Social Media.....

4.5 Platform-Specific Strategies:.....

Learning to tailor marketing strategies for different social media platforms such as Facebook, Instagram, and LinkedIn.: Platform-Specific Strategies for Social Media Marketing.....

4.6 Social Media Advertising:.....

Engagement and Community Building:.....

Metrics and Analytics: Engagement and Community Building.....

Case Studies and Best Practices.....

4.6 Case Studies and Best Practices.....

.4.1 .12.15,,5.1 Advanced Telemedicine and Remote Healthcare Production.....

5.2 Introduction to Telemedicine and Remote Healthcare: Advanced Telemedicine and Remote Healthcare Production.....

5.3 Television and Radio Production Essentials:.....

5.4 Medical Narrative and Storytelling.....

Crafting compelling stories that communicate complex healthcare concepts effectively to a diverse audience.: 5.3 Television and Radio Production Essentials.....

5.6 Remote Healthcare Technologies and Innovations: .....

5.9 Audience Engagement and Feedback in Healthcare Broadcasting.....

5.11 Future Trends in Telemedicine and Media Integration.....

4.1 .12.15.6.1 Technical Writing for Technology.....

6.2 Introduction to Technical Writing.....

6.3 Understanding Your Audience:.....

6.9 Editing and Proofreading: Editing and Proofreading .....

6.10 Ethics in Technical Writing.....

6.10 Ethics in Technical Writing.....

6.12 Effective Communication in Teams.....

4.1 .12.15.7.1.Masters in Vertical Farming and Urban

Agriculture with Focus on Synthetic Biology.....

7.2Introduction to Vertical Farming and Urban Agriculture.....

7.3.Fundamentals of Synthetic Biology.....

Study the basic principles of synthetic biology, including DNA sequencing, genetic engineering, and how these tools are used to optimize plant growth.: Fundamentals of Synthetic Biology.....

7.4..Applications of Synthetic Biology in Urban Agriculture.....

7.6Design of Vertical Farming Systems.....

7.7Integration of Biotechnology in Crop Production.....

7.8.Environmental and Economic Impacts of Urban Agriculture.....

7.9.Regulatory and Ethical Considerations in Synthetic Biology.....

7.10Future Trends in Vertical Farming and Synthetic Biology.....

4.1 .12.15..8.Master's in Urban Water Supply, Sewerage, Waste Management, and Remediation Activities.....

8.2.Introduction to Urban Water Supply Systems.....

8.3 Sewerage Systems Design and Manage.....

8.3.Sewerage Systems Design and Management.....

Learn about the engineering, design, and operational management of urban sewerage systems, focusing on sustainable practices and innovations in waste treatment and resource recovery.: Sewerage Systems Design and Management.....

8.4.Urban Waste Management Strategies.....

8.5.Remediation Activities and Technologies.....

8.6.Policy and Regulation in Urban Water and Waste.....

8.7.Climate Change and its Impact on Water and Waste Management.....

8.8..Sustainable Innovations in Water and Waste Systems .....

4.1 .12.15..9.1.Transportation and Warehousing in Tourism

Planning and Development.....

9.2..Introduction to Tourism Logistics.....

9.3...Transportation Infrastructure in Tourism.....

9.4..Role of Warehousing in Tourism.....

9.5..Sustainable Transport Solutions.....

9.6..Tourism Supply Chain Management.....

9.7.Policy and Regulations in Tourism Transport.....

9.8.Innovations in Tourism Warehousing.....

Investigates recent technological advancements in warehousing that support tourism industry needs. 9.8 Innovations in Tourism Warehousing.....

9.9..Case Studies on Tourism and Logistics.....

4.1 .12.15.10.1..Spatial Computing in Telecommunications .....

10.2..Introduction to Spatial Computing.....

10.3..Spatial Data and Telecommunications.....

10.4..Geographical Information Systems (GIS) in Telecom .....

10.5..Network Planning and Optimization Using Spatial Computing.....

10.6.Spatial Data Analytics for Telecom.....

10.7..Augmented Reality (AR) in Telecommunication Services.....

10.11..5G and Spatial Computing.....

10.12..Privacy and Security in Spatial Telecommunications.....

4.1 .12.15..11.1..Advanced Legal Studies in Public Administration and Safety.....

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11.3.Constitutional Law and Governance.....

11.4.Administrative Law.....

11.5.Legal Frameworks for Public Safety.....

11.6..Ethics in Public Administration.....

11.7..Public Policy and Legal Implications.....

11.8..Human Rights and Social Justice.....

11.9.Crisis Management and Legal Compliance.....

4.1 .12.15..12.1Metallurgy in Oil and Gas Production, Refining, and Transport.....

12.2..Introduction to Metallurgy in Oil and Gas.....

12.3..Material Selection for Oil and Gas Production.....

12.4..Corrosion Mechanisms and Prevention.....

12.5..Metallurgical Processes in Refining.....

Discusses how metallurgical processes like heat treatment and welding are utilized in refining operations to enhance material properties. Corrosion Mechanisms and Prevention.....

12.6..Pipeline Materials and Design.....

12.7.Advanced Coatings and Surface Treatments.....

Advanced Coatings and Surface Treatments.....

12.8.Environmental Impact and Sustainability in Metallurgy.....

12.9..Failure Analysis and Case Studies.....

12.10Future Trends in Metallurgy for Oil and Gas.....

4.1 .12.15..13.1.Integrated Water Management in Mining .....

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13.2.Water Resource Evaluation and Planning.....

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13.5.Innovation and Technology in Water Management .....

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15.4..CRISPR and Advanced Genetic Modification Techniques.....

15.5.Ethical and Regulatory Considerations.....

15.6.Biopharmaceutical Manufacturing.....

15.7.Fermentation Technology.....

15.8..Scale-Up and Commercialization.....

15.9.Quality Control in Genetically Engineered Products .....

15.10.Future Trends in Genetic Engineering Manufacturing.....

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15.10.Future Trends in Genetic Engineering Manufacturing.....

4.1 .12.15.16.1.Data Processing and Hosting Services in Computer Engineering.....

16.2.Introduction to Data Processing.....

16.3.Cloud Hosting Services.....

16.4..Big Data Technologies.....

16.5Data Security in Cloud Hosting.....

16.6.Containerization and Microservices.....

16.7Distributed Systems.....

16.8.Data Warehousing and Analytics.....
16.9..Serverless Computing.....
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17.6.Blockchain in Supply Chain Management.....
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17.8 Regulation and Compliance in Blockchain.....
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4.1 .12.15.18.1.Advanced Cybersecurity in Bibliotechnology

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18.2.Introduction to Cybersecurity in Bibliotechnology .....

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18.4.Data Privacy and Integrity in Bibliotechnology.....

18.5.Implementing Security Policies for Digital Libraries .....

18.6.Access Control in Library Networks.....

18.7.Digital Rights Management in Bibliotechnology.....

18.8.Network Security Essentials for Digital Libraries .....

18.9.Incident Response and Recovery for Digital Libraries .....

18..10Emerging Cybersecurity Technologies in Bibliotechnology.....

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18.8 Network Security Essentials for Digital Libraries .....

18.9 Incident Response and Recovery for Digital Libraries.....

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19.5.Real-time Data Processing.....
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19.6.Edge Analytics for Energy Management.....
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21.7 Privacy and Data Security in DLT.....
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22.7.Motivational Strategies for Adult Learners.....
22.8.Professional Development for Adult Educators.....
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22.6.Quantum Programming Languages.....
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22.9.Quantum Supremacy and its Implications.....
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23.3 Quantum Gates and Circuits.....
23.4 Quantum Information Theory.....
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23.5.Brain-Computer Interfaces in Education.....
23.6.Cognitive Load Theory and Neurotechnology.....
23.7.Neuroscience-Based Adaptive Learning Technologies .....
23.8.Ethical and Social Implications.....
23.9.Case Studies in Neurotechnology Education.....
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23.6 Cognitive Load Theory and Neurotechnology.....

23.7 Neuroscience-Based Adaptive Learning Technologies.....

23.8 Ethical and Social Implications.....

23.9 Case Studies in Neurotechnology Education.....

23.10 Future Trends in Neurotechnology for Education .....

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24.2Introduction to Robotic Process Automation.....

24.3.Fundamentals of Electrochemical Engineering.....

24.4.RPA Tools and Platforms.....

24.5.Automating Electrochemical Process Controls.....

24.6.Data Collection and Analysis in Electrochemical Systems.....

24.7.Machine Learning and RPA in Electrochemical Engineering.....

24.8.RPA Implementation Challenges and Solutions.....

24.9.Case Studies and Industry Applications.....

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24.2 Introduction to Robotic Process Automation.....

24.3 Fundamentals of Electrochemical Engineering.....

24.4 RPA Tools and Platforms.....

24.5 Automating Electrochemical Process Controls.....

24.6 Data Collection and Analysis in Electrochemical Systems.....

24.7 Machine Learning and RPA in Electrochemical Engineering.....

24.8 RPA Implementation Challenges and Solutions .....

24.9 Case Studies and Industry Applications.....

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25.2.Introduction to Renewable Energy.....

25.3.Educational Technology Tools.....

25.4.Designing Interactive Learning Modules.....

25.5.Gamification in Renewable Energy Education.....

25.6.Virtual Labs and Simulations.....

25.7.Assessing Learner Outcomes in Technology-Driven Curriculum.....

25.8.Case Studies in Renewable Energy Education.....

25.9.Challenges in Integrating Technology and Renewable Energy Education.....

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25.7 Assessing Learner Outcomes in Technology-Driven Curriculum.....

25.8 Case Studies in Renewable Energy Education.....

25.9 Challenges in Integrating Technology and Renewable Energy Education.....

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26.2.Introduction to Wholesale Trade.....

26.3.Supply Chain Dynamics.....

26.4.Inventory Control Methods.....

26.5.Logistics and Distribution.....

26.6.Procurement Strategies.....

26.7.Market Analysis and Forecasting.....

27.8.Risk Management in Wholesale Trade.....

27.9.Regulatory and Ethical Considerations.....

26.1 Wholesale Trade Management in Industrial Engineering.....

26.2 Introduction to Wholesale Trade.....

26.3 Supply Chain Dynamics.....

26.4 Inventory Control Methods.....
26.5 Logistics and Distribution.....
26.6 Procurement Strategies.....
26.7 Market Analysis and Forecasting.....
26.8 Risk Management in Wholesale Trade.....
26.9 Regulatory and Ethical Considerations.....
4.1 .12.15..29. 1.Advanced Wireless Communications.....
29.2.Introduction to Wireless Communications.....
29.3.Radio Frequency Fundamentals.....
29.4.Wireless Signal Propagation.....
29.5.Multiple Access Techniques.....
29.6.Wireless Networking and Protocols.....
29.7.Cellular Systems and 5G.....
29.8..Antenna Theory and Design.....
29.8Wireless Security.....
29.6IoT and Wireless Sensor Networks.....
29.1 Advanced Wireless Communications.....
29.2 Introduction to Wireless Communications.....
29.3 Radio Frequency Fundamentals.....
29.4 Wireless Signal Propagation.....
29.5 Multiple Access Techniques.....
29.6 Wireless Networking and Protocols.....
29.7 Cellular Systems and 5G.....
29.8 Antenna Theory and Design.....
29.9 Wireless Security.....
29.10 IoT and Wireless Sensor Networks.....
4.1 .12.15.30.1.Advanced Electrical Engineering in Construction and Civil Engineering.....
30.2. Fundamentals of Electrical Systems in Construction .....
30.3.Electrical Safety Standards and Codes.....
30.4.Integration of Electrical Systems in Building Design .....

30.5Sustainable and Renewable Energy Technologies .....

30.6.Smart Grids and Intelligent Networks.....

30.7.Electrical System Design and Simulation.....

30.8.Power Quality and Energy Management.....

30.9.Electrical Systems in Infrastructure Projects.....

Advanced Electrical Engineering in Construction and Civil Engineering.....

30.2 Fundamentals of Electrical Systems in Construction.....

30.3 Electrical Safety Standards and Codes.....

30.4 Integration of Electrical Systems in Building Design.....

30.5 Sustainable and Renewable Energy Technologies .....

30.6 Smart Grids and Intelligent Networks.....

30.7 Electrical System Design and Simulation.....

30.8 Power Quality and Energy Management.....

30.9 Electrical Systems in Infrastructure Projects.....

4.1 .12.15.Electrical Systems in Construction and Civil Engineering.....

Introduction to Electrical Systems in Construction.....

Power Distribution in Buildings.....

Lighting Systems and Design.....

Electrical Safety Standards and Regulations.....

Sustainability in Electrical Engineering.....

Smart Buildings and IoT Integration.....

Electrical Load Analysis and Estimation.....

Integration of Renewable Energy Sources.....

Project Management in Electrical Engineering.....

4.1 .12.15.30.1.Doctorate in Specialist Engineering Infrastructure and Contractors: Electrical Engineering .....

30.2.Advanced Power System Analysis.....

30.3Renewable Energy Systems.....
30.4.Electrical Infrastructure Design and Management .....
31.5.Smart Grids and IoT Applications.....
31.6..High Voltage Engineering.....
31.7.Project Management in Electrical Engineering.....
31.8Energy Policy and Ethical Considerations.....
31.1Sustainable Electrical Engineering Practices.....
30.1 Doctorate in Specialist Engineering Infrastructure and Contractors: Electrical Engineering.....
30.2 Advanced Power System Analysis.....
30.3 Renewable Energy Systems.....
30.4 Electrical Infrastructure Design and Management .....
31.5 Smart Grids and IoT Applications.....
31.6 High Voltage Engineering.....
31.7 Project Management in Electrical Engineering .....
31.8 Energy Policy and Ethical Considerations.....
31.9 Sustainable Electrical Engineering Practices.....
Admission Ready - Completing your application - Atlantic International University.....
32.Topic.....
4.1 .12.15..32.1Clean Energy Technology: Ecotechnology Applications.....
32.3.Introduction to Clean Energy and Ecotechnology .....
32.4.Solar Energy Technologies.....
32.5.Wind Energy Systems.....
32.6.Bioenergy and Biomass.....
32.7.Hydropower and Ocean Energy.....
32.8.Geothermal Energy.....
32.9.Energy Storage and Smart Grids.....
32.10.Policy and Economics of Clean Energy.....

32.11Ecological Impact of Renewable Energy.....

32.12.Future Directions in Clean Energy and Ecotechnology.....

2.1 Clean Energy Technology: Ecotechnology Applications.....

32.3 Introduction to Clean Energy and Ecotechnology .....

32.4 Solar Energy Technologies.....

32.5 Wind Energy Systems.....

32.6 Bioenergy and Biomass.....

32.7 Hydropower and Ocean Energy.....

32.8 Geothermal Energy.....

32.9 Energy Storage and Smart Grids.....

32.10 Policy and Economics of Clean Energy.....

32.11 Ecological Impact of Renewable Energy.....

32.12 Future Directions in Clean Energy and Ecotechnology.....

33.Topics.....

4.1 .12.15.33.1Integration of Electronic Engineering in Construction and Civil Engineering.....

33.2.Introduction to Electronic Systems in Civil Engineering.....

33.3.Smart Construction Technologies.....

33.4.IoT in Infrastructure Management.....

33.5.Electronic Monitoring and Control Systems.....

33.6.Automation in Construction Machinery.....

33.7.Solar and Renewable Energy Systems in Civil Engineering.....

33.8.Building Information Modeling (BIM) and Electronic Systems.....

33.9.Cybersecurity in Smart Infrastructure.....

33.1 Integration of Electronic Engineering in Construction and Civil Engineering.....

33.2 Introduction to Electronic Systems in Civil Engineering.....

33.3 Smart Construction Technologies.....
33.4 IoT in Infrastructure Management.....
33.5 Electronic Monitoring and Control Systems.....
33.6 Automation in Construction Machinery.....
33.7 Solar and Renewable Energy Systems in Civil Engineering.....
33.8 Building Information Modeling (BIM) and Electronic Systems.....
33.9 Cybersecurity in Smart Infrastructure.....
34.1.Topic.....
4.1 .12.15..34.2.Masters in Immutable Data Storage Solutions for Web Design.....
34.3.Introduction to Immutable Data.....
33.4.Immutable Data Structures.....
33.5.Immutable.js and Alternatives.....
33.6.State Management with Immutable Data.....
33.7.Performance Benefits of Immutable Data.....
33.8.GraphQL and Immutable Data.....
33.9.Immutable Data in Server-Side Rendering (SSR) .....
33.10.Security and Immutable Data.....
33.11.Future Trends in Immutable Data.....
Masters in Immutable Data Storage Solutions for Web Design.....
34.2 Introduction to Immutable Data.....
34.3 Immutable Data Structures.....
34.4.....
34.Topic.....
4.1 .12.15.34.1.Masters in Immutable Data Storage Solutions for Web Design.....
34.2.Introduction to Immutable Data.....
34.3.Immutable Data Structures.....
34.4.Immutable.js and Alternatives.....
34.5.State Management with Immutable Data.....

34.6.Performance Benefits of Immutable Data.....
34.6.GraphQL and Immutable Data.....
34.7.Immutable Data in Server-Side Rendering (SSR) .....
34.8.Security and Immutable Data.....
34.9.Future Trends in Immutable Data.....
34.1 Masters in Immutable Data Storage Solutions for Web Design.....
34.2 Introduction to Immutable Data.....
34.3 Immutable Data Structures.....
34.4.....
35.1.Topic.....
4.1 .12.15..35.2.Advanced Cyber-Physical Systems in Telecommunications.....
35.3.Introduction to Cyber-Physical Systems.....
35.4.Network Architecture in CPS.....
35.5..IoT and Cyber-Physical Systems.....
35.6.Security and Privacy in CPS.....
35.7.Real-time Data Processing and Analytics.....
35.8.Machine Learning in Cyber-Physical Systems.....
35.9.Emerging Trends in CPS and Telecommunications .....
35.10.CPS Case Studies in Telecommunications.....
35.2 Advanced Cyber-Physical Systems in Telecommunications.....
35.3 Introduction to Cyber-Physical Systems.....
35.4 Network Architecture in CPS.....
35.5 IoT and Cyber-Physical Systems.....
35.6 Security and Privacy in CPS.....
35.7 Real-time Data Processing and Analytics.....
35.8 Machine Learning in Cyber-Physical Systems.....
35.9 Emerging Trends in CPS and Telecommunications .....
35.10 CPS Case Studies in Telecommunications.....

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36. Topics:.....
37. Master's Program in Artificial Intelligence and Machine Learning for Software Engineering.....
4.1 .12.15..36.1.Introduction to Artificial Intelligence and Machine Learning.....
36.2.Data Preprocessing and Feature Engineering.....
36.3.Supervised Learning Techniques.....
36.4.Unsupervised Learning and Clustering.....
36.5.Deep Learning and Neural Networks.....
36.6.Natural Language Processing.....
36.7.AI/ML in Software Development Lifecycle.....
36.8.Ethical and Responsible AI.....
36.8.Deployment and Scaling of AI Solutions.....
37.1 Master's Program in Artificial Intelligence and Machine Learning for Software Engineering.....
37.2 Introduction to Artificial Intelligence and Machine Learning.....
37.3 Data Preprocessing and Feature Engineering.....
37.4 Supervised Learning Techniques.....
37.5 Unsupervised Learning and Clustering.....
37.6 Deep Learning and Neural Networks.....
37.7 Natural Language Processing.....
37.8 AI/ML in Software Development Lifecycle.....
37.9 Ethical and Responsible AI.....
37.10 Deployment and Scaling of AI Solutions.....
37..Topics:.....
4.1 .12.15.37.1.Advanced Studies in Autonomous Vehicles and Drones for Electric Vehicle Engineering.....
37.1.Introduction to Autonomous Systems.....
37.2Electric Vehicle Engineering Basics.....
37.3.Sensor Technologies and Data Processing.....
37.4.Machine Learning and AI for Autonomous Systems

.....

37.5.Communication Networks and IoT.....

37.6.Control Systems for Autonomous Vehicles.....

37.7Ethical and Regulatory Aspects.....

37.8.Testing and Validation of Autonomous Systems.....

37.9.Integration of Renewable Energy in Autonomous Systems.....

37.1 Advanced Studies in Autonomous Vehicles and Drones for Electric Vehicle Engineering.....

37.2 Introduction to Autonomous Systems.....

37.3 Electric Vehicle Engineering Basics.....

37.4 Sensor Technologies and Data Processing.....

37.5 Machine Learning and AI for Autonomous Systems .....

37.6 Communication Networks and IoT.....

37.7 Control Systems for Autonomous Vehicles.....

37.8 Ethical and Regulatory Aspects.....

37.9 Testing and Validation of Autonomous Systems .....

37.10 Integration of Renewable Energy in Autonomous Systems.....

38.1.topics.....

4.1 .12.15.38.2:Specialist Engineering in Infrastructure and Contractors: Electrochemical Engineering.....

38.3.Introduction to Electrochemical Engineering.....

38.4.Battery Technologies for Infrastructure.....

38.5.Fuel Cells and Their Applications.....

38.6.and Its Prevention.....

38.7..Electrochemical Sensors and Monitoring.....

38.8.Electrolysis and Industrial Processes.....

38.9.Sustainability and Electrochemical Engineering.....

.38.10.Advanced Topics in Electrochemical Engineering .....

38.2 Specialist Engineering in Infrastructure and

Contractors: Electrochemical Engineering.....
38.3 Introduction to Electrochemical Engineering.....
38.4 Battery Technologies for Infrastructure.....
38.5 Fuel Cells and Their Applications.....
38.6 Corrosion and Its Prevention.....
38.7 Electrochemical Sensors and Monitoring.....
38.8 Electrolysis and Industrial Processes.....
38.9 Sustainability and Electrochemical Engineering .....
38.10 Advanced Topics in Electrochemical Engineering .....
4.1 .12.15..40.1Topics:Energy Storage and Battery Technology.....
40.2.Introduction to Energy Storage Systems.....
40.3.Battery Chemistry and Physics.....
40.4.Design and Functionality of Battery Cells.....
40.5.Applications of Battery Storage.....
40.6.Efficiency and Performance Measurements.....
40.7.Safety and Environmental Impacts.....
40.8.Advanced Energy Storage Technologies.....
40.9.Policy and Economics of Energy Storage.....
40.10.Future Trends in Battery Technology.....
41.1.Topics:.....
41.2.Advanced Robotic Process Automation in Electrical Engineering.....
41.3.Introduction to Robotic Process Automation.....
41.4.RPA Tools and Technologies.....
41.5.Automating Electrical Design Processes.....
41.6.Data Migration and Management.....
41.7.RPA in Control Systems.....
41.8.Machine Learning and RPA.....
41.9.RPA and IoT in Electrical Systems.....
41.10.Security and Ethics in RPA.....

1.2 Advanced Robotic Process Automation in Electrical Engineering.....
41.3 Introduction to Robotic Process Automation.....
41.4 RPA Tools and Technologies.....
41.5 Automating Electrical Design Processes.....
41.6 Data Migration and Management.....
41.7 RPA in Control Systems.....
41.8 Machine Learning and RPA.....
41.9 RPA and IoT in Electrical Systems.....
41.10 Security and Ethics in RPA.....
44..1. Define the Problem.....
2. Develop the Mathematical Model.....
3. Simplify the Equations.....
4. Analytical Solution (if possible).....
5. Numerical Solution (if necessary).....
6. Simulation and Validation.....
7. Optimization (if applicable).....
Example Calculation: Load Flow Analysis in Power Systems.....
1. Circuit Analysis.....
2. Electromagnetics.....
3. Signal Processing.....
4. Control Systems.....
5. Power Systems.....
6. Electronics.....
7. Digital Systems.....
8. Communication Systems.....
9. Renewable Energy Systems.....
1. Circuit Analysis.....
2. Electromagnetics.....
3. Signal Processing.....
4. Control Systems.....
5. Power Systems.....

6. Electronics.....
7. Digital Systems.....
8. Communication Systems.....
9. Renewable Energy Systems.....
. Circuit Design and Analysis.....
2. Power Systems Engineering.....
3. Control Systems.....
4. Communication Systems.....
5. Electronics and Semiconductor Design.....
6. Renewable Energy Systems.....
7. Building and Infrastructure.....
8. Biomedical Engineering.....
1. Signal Processing.....
2. Communication Systems.....
3. Information Theory.....
4. Network Theory.....
5. Electromagnetic Theory.....
6. Digital Communication.....
1. Signal Processing.....
2. Communication Systems.....
3. Information Theory.....
4. Network Theory.....
5. Electromagnetic Theory.....
6. Digital Communication.....
Practical Examples:.....
IoT (Internet of Things).....
Solar Power Systems.....
Wind Energy Projects.....
Communication Systems Calculations.....
1. MIMO (Multiple Input Multiple Output) Systems.....
2. Satellite Communication.....
3. Optical Fiber Communication.....

4. IoT (Internet of Things).....
Ancient Times.....
System Design and Operation.....
Battery Technologies for Infrastructure.....
34.6 Performance Benefits of Immutable Data.....
38.7 Electrochemical Sensors and Monitoring.....
38.8 Electrolysis and Industrial Processes.....
38.9 Sustainability and Electrochemical Engineering .....
5. Automating Electrical Design Processes.....
Integral and Derivative Calculations in Automating Electrical Design Processes.....
Project Management in Electrical Engineering.....
Integral and Derivative Calculations in Project Management.....
Wind Energy, Solar Energy, and Hydroelectric Power .....
Electrical Infrastructure Design and Management.....
Smart Grids and IoT Applications.....
Understanding the Basic Concepts of Social Media Marketing.....
Television and Radio Production Essentials.....
Roberto Aldrett - AIU.....
Career Coach.....
Life-Coach Consulting.....
The Future Of Science and Engineering.....
The Constantly Changing Education Landscape.....
Academic Freedom to Discover Your Purpose Open Curriculum Design at Atlantic International University .....
Core Courses and Topics in Engineering Systems:.....
Orientation Courses:.....
Research Project in Engineering Systems:.....
Academic Freedom to Discover Your Purpose Open

Curriculum Design at Atlantic International University .....

Core Courses and Topics in Engineering Systems:.....

Orientation Courses:.....

Research Project in Engineering Systems:.....

Academic Freedom to Discover Your Purpose Open Curriculum Design at Atlantic International University .....

Core Courses and Topics in Engineering Systems:.....

Orientation Courses:.....

Research Project in Engineering Systems:.....

Student name : tshingombe tshitadi.....

1 topics :.....

1 AGI in Human-Machine Collaboration.....

Future Scenarios of AGI Development.....

1.10nline Retail and E-commerce in the Renewable Energy Sector.....

1.2 Introduction to E-commerce in the Renewable Energy Sector.....

1.3 Understanding the Renewable Energy Market.....

Targeted, flexible and co-ordinated policies can unlock the potential of e-commerce.....

1.4. E-commerce Strategies for Renewable Energy Products.....

1.4 Consumer Behavior in Online Retail.....

3.1 Electric power B2B descriptions.....

3.2 Notations.....

1.5 Digital Marketing for Renewable Energy E-commerce .....

1.6. Sustainable Practices in E-commerce.....

1.7 Case Studies in Renewable Energy E-commerce:.....

3.3 Fusion of behavioral data.....

3.4 Fusion of item attribute information.....

3.5 Fusion of behavioral data and item information.....

1.8 Regulatory Environment for Online Retail in Renewable Energy:.....

Experiments and discussion.....

4.1 Data descriptions.....

1.9 Future Trends in Online Retail and Renewable Energy.....

Future Research Frontiers in AI for the E-commerce Sector.....

2.1Publishing and Natural Resources Management:.....

2.2 Introduction to Sustainable Natural Resources Management:.....

This topic covers the fundamental principles of sustainable natural resource management and its importance for future generations. Challenges in natural resource management for ecological sustainability.....

2.3.1 Resource planning strategy and ownership regime .....

2.3 The Role of Publishing in Sustainability:.....

2.4 Environmental Journalism and Communication.....

2.5 Digital Publishing and New Media.....

2.6 Content Creation for Natural Resource Management .....

2.2. New journals on SDG-relevant topics.....

2.8 Sustainable Practices in Publishing:.....

2.9. Case Studies in Effective Sustainability Communication:.....

3.3. Equity recommended.....

4. Translating research into practice.....

4.1. Cognitive accessibility.....

3.1 Masters in Supply Chain Management and Traceability .....

3.2 Introduction to Supply Chain Management.....

between functions within their own companies, but also with other An Introduction to Supply Chain Management .....

3.3. Principles of Traceability.....

3.4 Software Engineering Basics:.....

3.5 Supply Chain Digitalization.....

3.6 Data Management in Supply Chains.....

3.7 Blockchain for Supply Chain Traceability.....

IoT and Smart Supply Chains.....

3.8 Security and Privacy in Supply Chain Software:.....

3.9 Case Studies and Real-world Applications.....

4.1 Social Media Marketing for Real Estate, Rental, and Leasing.....

4.1 Social Media Marketing for Real Estate, Rental, and Leasing.....

4.2 Introduction to Social Media Marketing.....

4.2 Introduction to Social Media Marketing.....

Understanding the basic concepts of social media marketing and its importance in the real estate, rental, and leasing sectors.: Understanding the Basic Concepts of Social Media Marketing.....

Importance of Social Media Marketing in Real Estate, Rental, and Leasing.....

4.3 Target Audience Analysis.....

4.4 Content Creation for Real Estate.....

Strategies for creating compelling content that attracts and retains the interest of potential clients on social media.: Target Audience Analysis for Real Estate, Rental, and Leasing on Social Media.....

4.5 Platform-Specific Strategies:.....

Learning to tailor marketing strategies for different social media platforms such as Facebook, Instagram, and LinkedIn.: Platform-Specific Strategies for Social Media Marketing.....

4.6 Social Media Advertising:.....

Engagement and Community Building:.....

Metrics and Analytics: Engagement and Community Building.....

Case Studies and Best Practices.....

4.6 Case Studies and Best Practices.....

5.1 Advanced Telemedicine and Remote Healthcare Production.....

5.2 Introduction to Telemedicine and Remote Healthcare: Advanced Telemedicine and Remote Healthcare Production.....

5.3 Television and Radio Production Essentials:.....

5.4 Medical Narrative and Storytelling.....

Crafting compelling stories that communicate complex healthcare concepts effectively to a diverse audience.: 5.3 Television and Radio Production Essentials.....

5.6 Remote Healthcare Technologies and Innovations: .....

5.9 Audience Engagement and Feedback in Healthcare Broadcasting.....

5.11 Future Trends in Telemedicine and Media Integration.....

6.1 Technical Writing for Technology.....

6.2 Introduction to Technical Writing.....

6.3 Understanding Your Audience:.....

6.9 Editing and Proofreading: Editing and Proofreading .....

6.10 Ethics in Technical Writing.....

6.10 Ethics in Technical Writing.....

6.12 Effective Communication in Teams.....

7.1.Masters in Vertical Farming and Urban Agriculture with Focus on Synthetic Biology.....

7.2Introduction to Vertical Farming and Urban Agriculture.....

7.3.Fundamentals of Synthetic Biology.....

Study the basic principles of synthetic biology, including DNA sequencing, genetic engineering, and how these tools are used to optimize plant growth.: Fundamentals of Synthetic Biology.....

7.4..Applications of Synthetic Biology in Urban

Agriculture.....

7.6Design of Vertical Farming Systems.....

7.7Integration of Biotechnology in Crop Production.....

7.8.Environmental and Economic Impacts of Urban Agriculture.....

7.9.Regulatory and Ethical Considerations in Synthetic Biology.....

7.10Future Trends in Vertical Farming and Synthetic Biology.....

8.Master's in Urban Water Supply, Sewerage, Waste Management, and Remediation Activities.....

8.2.Introduction to Urban Water Supply Systems.....

8.3 Sewerage Systems Design and Manage.....

8.3.Sewerage Systems Design and Management.....

Learn about the engineering, design, and operational management of urban sewerage systems, focusing on sustainable practices and innovations in waste treatment and resource recovery.: Sewerage Systems Design and Management.....

8.4.Urban Waste Management Strategies.....

8.5.Remediation Activities and Technologies.....

8.6.Policy and Regulation in Urban Water and Waste.....

8.7.Climate Change and its Impact on Water and Waste Management.....

8.8..Sustainable Innovations in Water and Waste Systems .....

9.1.Transportation and Warehousing in Tourism Planning and Development.....

9.2..Introduction to Tourism Logistics.....

9.3...Transportation Infrastructure in Tourism.....

9.4..Role of Warehousing in Tourism.....

9.5..Sustainable Transport Solutions.....

9.6..Tourism Supply Chain Management.....

9.7.Policy and Regulations in Tourism Transport.....

9.8.Innovations in Tourism Warehousing.....

Investigates recent technological advancements in warehousing that support tourism industry needs. 9.8 Innovations in Tourism Warehousing.....

9.9..Case Studies on Tourism and Logistics.....

10.1..Spatial Computing in Telecommunications.....

10.2..Introduction to Spatial Computing.....

10.3..Spatial Data and Telecommunications.....

10.4..Geographical Information Systems (GIS) in Telecom .....

10.5..Network Planning and Optimization Using Spatial Computing.....

10.6.Spatial Data Analytics for Telecom.....

10.7..Augmented Reality (AR) in Telecommunication Services.....

10.11..5G and Spatial Computing.....

10.12..Privacy and Security in Spatial Telecommunications.....

11.1..Advanced Legal Studies in Public Administration and Safety.....

11.2Introduction to Public Law.....

11.3.Constitutional Law and Governance.....

11.4.Administrative Law.....

11.5.Legal Frameworks for Public Safety.....

11.6..Ethics in Public Administration.....

11.7..Public Policy and Legal Implications.....

11.8..Human Rights and Social Justice.....

11.9.Crisis Management and Legal Compliance.....

12.1Metallurgy in Oil and Gas Production, Refining, and Transport.....

12.2..Introduction to Metallurgy in Oil and Gas.....

12.3..Material Selection for Oil and Gas Production.....

12.4..Corrosion Mechanisms and Prevention.....

12.5..Metallurgical Processes in Refining.....

Discusses how metallurgical processes like heat treatment and welding are utilized in refining

operations to enhance material properties. Corrosion Mechanisms and Prevention.....
12.6..Pipeline Materials and Design.....
12.7.Advanced Coatings and Surface Treatments.....
Advanced Coatings and Surface Treatments.....
12.8.Environmental Impact and Sustainability in Metallurgy.....
12.9..Failure Analysis and Case Studies.....
12.10Future Trends in Metallurgy for Oil and Gas.....
13.1.Integrated Water Management in Mining.....
13.2.Introduction to Mining Water Management.....
13.2.Water Resource Evaluation and Planning.....
13.3.Water Quality Management in Mining.....
13.4.Regulatory and Environmental Compliance.....
13.5.Innovation and Technology in Water Management .....
13.6.Stakeholder Engagement and Social License.....
13.7..Climate Change Impacts on Water Resources.....
13.8.Case Studies and Best Practices.....
13.7.Future Trends in Mining Water Management.....
3.1 Integrated Water Management in Mining.....
13.2 Introduction to Mining Water Management.....
13.3 Water Resource Evaluation and Planning.....
13.4 Water Quality Management in Mining.....
13.5 Regulatory and Environmental Compliance.....
13.6 Innovation and Technology in Water Management .....
13.7 Stakeholder Engagement and Social License.....
13.8 Climate Change Impacts on Water Resources.....
13.9 Case Studies and Best Practices.....
13.10 Future Trends in Mining Water Management.....
14.Integrated Water Management in Mining.....
14.1.Introduction to Mining Water Management.....

14.2.Water Resource Evaluation and Planning.....
14.3Water Quality Management in Mining.....
14.4.Regulatory and Environmental Compliance.....
14.5.Innovation and Technology in Water Management .....
14.6..Stakeholder Engagement and Social License.....
14.7Climate Change Impacts on Water Resources.....
14.8..Case Studies and Best Practices.....
14..9..Future Trends in Mining Water Management.....
14 Integrated Water Management in Mining.....
14.1 Introduction to Mining Water Management.....
14.2 Water Resource Evaluation and Planning.....
14.3 Water Quality Management in Mining.....
14.4 Regulatory and Environmental Compliance.....
14.5 Innovation and Technology in Water Management .....
14.6 Stakeholder Engagement and Social License.....
14.7 Climate Change Impacts on Water Resources.....
14.8 Case Studies and Best Practices.....
14.9 Future Trends in Mining Water Management.....
15.1.Advanced Manufacturing Techniques in Genetic Engineering.....
15.2.Introduction to Genetic Engineering.....
15.3..Manufacturing Processes in Biotechnology.....
15.4..CRISPR and Advanced Genetic Modification Techniques.....
15.5.Ethical and Regulatory Considerations.....
15.6.Biopharmaceutical Manufacturing.....
15.7.Fermentation Technology.....
15.8..Scale-Up and Commercialization.....
15.9.Quality Control in Genetically Engineered Products .....
15.10.Future Trends in Genetic Engineering Manufacturing.....

15.1.Advanced Manufacturing Techniques in Genetic Engineering.....

15.2.Introduction to Genetic Engineering.....

15.3..Manufacturing Processes in Biotechnology.....

15.4..CRISPR and Advanced Genetic Modification Techniques.....

15.5.Ethical and Regulatory Considerations.....

15.6.Biopharmaceutical Manufacturing.....

15.7.Fermentation Technology.....

15.8..Scale-Up and Commercialization.....

15.9.Quality Control in Genetically Engineered Products .....

15.10.Future Trends in Genetic Engineering Manufacturing.....

16.1.Data Processing and Hosting Services in Computer Engineering.....

16.2.Introduction to Data Processing.....

16.3.Cloud Hosting Services.....

16.4..Big Data Technologies.....

16.5Data Security in Cloud Hosting.....

16.6.Containerization and Microservices.....

16.7Distributed Systems.....

16.8.Data Warehousing and Analytics.....

16.9..Serverless Computing.....

16.1 Data Processing and Hosting Services in Computer Engineering.....

16.2 Introduction to Data Processing.....

16.3 Cloud Hosting Services.....

16.4 Big Data Technologies.....

16.5 Data Security in Cloud Hosting.....

16.6 Containerization and Microservices.....

16.7 Distributed Systems.....

16.8 Data Warehousing and Analytics.....

16.9 Serverless Computing.....

17.1.Masters in Cryptocurrency and Blockchain Applications.....
17.2.Introduction to Blockchain Technology.....
17.2.Cryptocurrencies: An Overview.....
17.3.Blockchain Consensus Mechanisms.....
17.4..Smart Contracts.....
17.5.Decentralized Finance (DeFi).....
17.6.Blockchain in Supply Chain Management.....
17.7.Regulation and Compliance in Blockchain.....
17.8.NFTs and Digital Assets.....
17.1 Masters in Cryptocurrency and Blockchain Applications.....
17.2 Introduction to Blockchain Technology.....
17.3 Cryptocurrencies: An Overview.....
17.4 Blockchain Consensus Mechanisms.....
17.5 Smart Contracts.....
17.6 Decentralized Finance (DeFi).....
17.7 Blockchain in Supply Chain Management.....
17.8 Regulation and Compliance in Blockchain.....
17.9 NFTs and Digital Assets.....
18.1.Advanced Cybersecurity in Bibliotechnology.....
18.2.Introduction to Cybersecurity in Bibliotechnology .....
18.3Threats and Vulnerabilities in Digital Libraries.....
18.4.Data Privacy and Integrity in Bibliotechnology.....
18.5.Implementing Security Policies for Digital Libraries .....
18.6.Access Control in Library Networks.....
18.7.Digital Rights Management in Bibliotechnology.....
18.8.Network Security Essentials for Digital Libraries .....
18.9.Incident Response and Recovery for Digital Libraries .....
18..10Emerging Cybersecurity Technologies in

Bibliotechnology.....

18.1 Advanced Cybersecurity in Bibliotechnology.....

18.2 Introduction to Cybersecurity in Bibliotechnology .....

18.3 Threats and Vulnerabilities in Digital Libraries .....

18.4 Data Privacy and Integrity in Bibliotechnology.....

18.5 Implementing Security Policies for Digital Libraries.....

18.6 Access Control in Library Networks.....

18.7 Digital Rights Management in Bibliotechnology .....

18.8 Network Security Essentials for Digital Libraries .....

18.9 Incident Response and Recovery for Digital Libraries.....

18.10 Emerging Cybersecurity Technologies in Bibliotechnology.....

19.1.1Edge Computing in Modern Power and Energy Systems.....

19.2..Introduction to Edge Computing.....

19.3.Distributed Computing in Energy Systems.....

19.4.IoT Applications in Power Systems.....

19.5.Real-time Data Processing.....

19.6Security and Privacy in Edge Computing.....

19.6.Edge Analytics for Energy Management.....

19.7.Energy Efficiency Optimization.....

19.8.Case Studies on Edge Computing in Energy.....

19.9.Future Trends in Edge Computing for Energy Systems.....

19.1 Edge Computing in Modern Power and Energy Systems.....

19.2 Introduction to Edge Computing.....

19.3 Distributed Computing in Energy Systems.....

19.4 IoT Applications in Power Systems.....

19.5 Real-time Data Processing.....
19.6 Security and Privacy in Edge Computing.....
19.7 Edge Analytics for Energy Management.....
19.8 Energy Efficiency Optimization.....
19.9 Case Studies on Edge Computing in Energy.....
19.10 Future Trends in Edge Computing for Energy Systems.....
Edge Computing for Modern Power and Energy Systems .....
Introduction to Edge Computing.....
Role of Edge Computing in Smart Grids.....
Edge Computing for Renewable Energy Integration.....
Data Management and Security in Edge Computing.....
Machine Learning Applications on the Edge.....
Case Studies in Edge Computing for Energy Systems.....
Challenges and Future Trends.....
20.1.Masters in Cyber-Physical Systems and Information Technology.....
20.2.Introduction to Cyber-Physical Systems.....
20.3.Architecture of CPS.....
20.4Networking and Communication in CPS.....
20.5.CPS Security and Privacy.....
20.6.Machine Learning in CPS.....
20.7.Real-Time Systems and CPS.....
20.8.Simulation and Modeling in CPS.....
20.9..Applications and Case Studies of CPS.....
20.1 Masters in Cyber-Physical Systems and Information Technology.....
20.2 Introduction to Cyber-Physical Systems.....
20.3 Architecture of CPS.....
20.4 Networking and Communication in CPS.....
20.5 CPS Security and Privacy.....
20.6 Machine Learning in CPS.....

20.7 Real-Time Systems and CPS.....
20.8 Simulation and Modeling in CPS.....
20.9 Applications and Case Studies of CPS.....
21.1.Masters in Distributed-Ledger Technology Applications in Educational Technology.....
21.1. Introduction to Distributed Ledger Technology 1285
21.2.The Need for Distributed Ledger Technology in Education.....
21.3.Blockchain for Secure Credentialing.....
21.4.Smart Contracts in Educational Transactions.....
21.5..DLT-based Learning Management Systems.....
Privacy and Data Security in DLT.....
21.6.Case Studies of DLT in Education.....
21.7.Future Trends in DLT and EdTech.....
21.1 Masters in Distributed-Ledger Technology Applications in Educational Technology.....
21.2 Introduction to Distributed Ledger Technology .....
21.3 The Need for Distributed Ledger Technology in Education.....
21.4 Blockchain for Secure Credentialing.....
21.5 Smart Contracts in Educational Transactions.....
21.6 DLT-based Learning Management Systems.....
21.7 Privacy and Data Security in DLT.....
21.8 Case Studies of DLT in Education.....
21.9 Future Trends in DLT and EdTech.....
22.1.Master's in Adult Education Services.....
22.1.Introduction to Adult Education.....
22.2.Theories of Adult Learning.....
22.3.Curriculum Design for Adult Learners.....
22.4.Assessment and Evaluation in Adult Education.....
22.5.Technology Integration in Adult Learning.....
22.6.Diversity and Inclusion in Adult Education.....

22.7.Motivational Strategies for Adult Learners.....
22.8.Professional Development for Adult Educators.....
22.1 Master's in Adult Education Services.....
22.2 Introduction to Adult Education.....
22.3 Theories of Adult Learning.....
22.4 Curriculum Design for Adult Learners.....
22.5 Assessment and Evaluation in Adult Education .....
22.6 Technology Integration in Adult Learning.....
22.7 Diversity and Inclusion in Adult Education.....
22.8 Motivational Strategies for Adult Learners.....
22.9 Professional Development for Adult Educators.....
23.1Quantum Computing in Systems Engineering.....
23.1.Introduction to Quantum Computing.....
23.2.Quantum Algorithms.....
22.3.Quantum Gates and Circuits.....
22.4.Quantum Information Theory.....
22.5.Quantum Computing Platforms.....
22.6.Quantum Programming Languages.....
22.7.Applications of Quantum Computing in Systems Engineering.....
22.8.Challenges and Future of Quantum Computing.....
22.9.Quantum Supremacy and its Implications.....
23.1 Quantum Computing in Systems Engineering.....
23.1 Introduction to Quantum Computing.....
23.2 Quantum Algorithms.....
23.3 Quantum Gates and Circuits.....
23.4 Quantum Information Theory.....
23.5 Quantum Computing Platforms.....
23.6 Quantum Programming Languages.....
23.7 Applications of Quantum Computing in Systems Engineering.....
23.8 Challenges and Future of Quantum Computing

.....
23.9 Quantum Supremacy and its Implications.....
23.2.Neurotechnology in Educational Technology.....
23.3.Introduction to Neurotechnology.....
23.4.Neuroscience Basics for Educators.....
23.5.Brain-Computer Interfaces in Education.....
23.6.Cognitive Load Theory and Neurotechnology.....
23.7.Neuroscience-Based Adaptive Learning Technologies
.....
23.8.Ethical and Social Implications.....
23.9.Case Studies in Neurotechnology Education.....
23.10.Future Trends in Neurotechnology for Education
.....
23.2 Neurotechnology in Educational Technology.....
23.3 Introduction to Neurotechnology.....
23.4 Neuroscience Basics for Educators.....
23.5 Brain-Computer Interfaces in Education.....
23.6 Cognitive Load Theory and Neurotechnology.....
23.7 Neuroscience-Based Adaptive Learning Technologies.....
23.8 Ethical and Social Implications.....
23.9 Case Studies in Neurotechnology Education.....
23.10 Future Trends in Neurotechnology for Education
.....
24.1.Robotic Process Automation in Electrochemical Engineering.....
24.2Introduction to Robotic Process Automation.....
24.3.Fundamentals of Electrochemical Engineering.....
24.4.RPA Tools and Platforms.....
24.5.Automating Electrochemical Process Controls.....
24.6.Data Collection and Analysis in Electrochemical Systems.....
24.7.Machine Learning and RPA in Electrochemical Engineering.....

24.8.RPA Implementation Challenges and Solutions.....

24.9.Case Studies and Industry Applications.....

4.1 Robotic Process Automation in Electrochemical Engineering.....

24.2 Introduction to Robotic Process Automation.....

24.3 Fundamentals of Electrochemical Engineering.....

24.4 RPA Tools and Platforms.....

24.5 Automating Electrochemical Process Controls.....

24.6 Data Collection and Analysis in Electrochemical Systems.....

24.7 Machine Learning and RPA in Electrochemical Engineering.....

24.8 RPA Implementation Challenges and Solutions .....

24.9 Case Studies and Industry Applications.....

25.1.Integrating Educational Technology in Renewable Energy Studies.....

25.2.Introduction to Renewable Energy.....

25.3.Educational Technology Tools.....

25.4.Designing Interactive Learning Modules.....

25.5.Gamification in Renewable Energy Education.....

25.6.Virtual Labs and Simulations.....

25.7.Assessing Learner Outcomes in Technology-Driven Curriculum.....

25.8.Case Studies in Renewable Energy Education.....

25.9.Challenges in Integrating Technology and Renewable Energy Education.....

25.1 Integrating Educational Technology in Renewable Energy Studies.....

25.2 Introduction to Renewable Energy.....

25.3 Educational Technology Tools.....

25.4 Designing Interactive Learning Modules.....

25.5 Gamification in Renewable Energy Education.....

25.6 Virtual Labs and Simulations.....

25.7 Assessing Learner Outcomes in Technology-Driven Curriculum.....

25.8 Case Studies in Renewable Energy Education.....

25.9 Challenges in Integrating Technology and Renewable Energy Education.....

26.1Wholesale Trade Management in Industrial Engineering.....

26.2.Introduction to Wholesale Trade.....

26.3.Supply Chain Dynamics.....

26.4.Inventory Control Methods.....

26.5.Logistics and Distribution.....

26.6.Procurement Strategies.....

26.7.Market Analysis and Forecasting.....

27.8.Risk Management in Wholesale Trade.....

27.9.Regulatory and Ethical Considerations.....

26.1 Wholesale Trade Management in Industrial Engineering.....

26.2 Introduction to Wholesale Trade.....

26.3 Supply Chain Dynamics.....

26.4 Inventory Control Methods.....

26.5 Logistics and Distribution.....

26.6 Procurement Strategies.....

26.7 Market Analysis and Forecasting.....

26.8 Risk Management in Wholesale Trade.....

26.9 Regulatory and Ethical Considerations.....

29. 1.Advanced Wireless Communications.....

29.2.Introduction to Wireless Communications.....

29.3.Radio Frequency Fundamentals.....

29.4.Wireless Signal Propagation.....

29.5.Multiple Access Techniques.....

29.6.Wireless Networking and Protocols.....

29.7.Cellular Systems and 5G.....

29.8..Antenna Theory and Design.....

29.8Wireless Security.....
29.6IoT and Wireless Sensor Networks.....
29.1 Advanced Wireless Communications.....
29.2 Introduction to Wireless Communications.....
29.3 Radio Frequency Fundamentals.....
29.4 Wireless Signal Propagation.....
29.5 Multiple Access Techniques.....
29.6 Wireless Networking and Protocols.....
29.7 Cellular Systems and 5G.....
29.8 Antenna Theory and Design.....
29.9 Wireless Security.....
29.10 IoT and Wireless Sensor Networks.....
30.1.Advanced Electrical Engineering in Construction and Civil Engineering.....
30.2. Fundamentals of Electrical Systems in Construction .....
30.3.Electrical Safety Standards and Codes.....
30.4.Integration of Electrical Systems in Building Design .....
30.5Sustainable and Renewable Energy Technologies .....
30.6.Smart Grids and Intelligent Networks.....
30.7.Electrical System Design and Simulation.....
30.8.Power Quality and Energy Management.....
30.9.Electrical Systems in Infrastructure Projects.....
Advanced Electrical Engineering in Construction and Civil Engineering.....
30.2 Fundamentals of Electrical Systems in Construction.....
30.3 Electrical Safety Standards and Codes.....
30.4 Integration of Electrical Systems in Building Design.....
30.5 Sustainable and Renewable Energy Technologies .....

30.6 Smart Grids and Intelligent Networks.....
30.7 Electrical System Design and Simulation.....
30.8 Power Quality and Energy Management.....
30.9 Electrical Systems in Infrastructure Projects.....
Electrical Systems in Construction and Civil Engineering .....
Introduction to Electrical Systems in Construction.....
Power Distribution in Buildings.....
Lighting Systems and Design.....
Electrical Safety Standards and Regulations.....
Sustainability in Electrical Engineering.....
Smart Buildings and IoT Integration.....
Electrical Load Analysis and Estimation.....
Integration of Renewable Energy Sources.....
Project Management in Electrical Engineering.....
30.1.Doctorate in Specialist Engineering Infrastructure and Contractors: Electrical Engineering.....
30.2.Advanced Power System Analysis.....
30.3Renewable Energy Systems.....
30.4.Electrical Infrastructure Design and Management .....
31.5.Smart Grids and IoT Applications.....
31.6..High Voltage Engineering.....
31.7.Project Management in Electrical Engineering.....
31.8Energy Policy and Ethical Considerations.....
31.1Sustainable Electrical Engineering Practices.....
30.1 Doctorate in Specialist Engineering Infrastructure and Contractors: Electrical Engineering.....
30.2 Advanced Power System Analysis.....
30.3 Renewable Energy Systems.....
30.4 Electrical Infrastructure Design and Management .....
31.5 Smart Grids and IoT Applications.....

31.6 High Voltage Engineering.....
31.7 Project Management in Electrical Engineering .....
31.8 Energy Policy and Ethical Considerations.....
31.9 Sustainable Electrical Engineering Practices.....
Admission Ready - Completing your application - Atlantic International University.....
32.Topic.....
32.1Clean Energy Technology: Ecotechnology Applications .....
32.3.Introduction to Clean Energy and Ecotechnology .....
32.4.Solar Energy Technologies.....
32.5.Wind Energy Systems.....
32.6.Bioenergy and Biomass.....
32.7.Hydropower and Ocean Energy.....
32.8.Geothermal Energy.....
32.9.Energy Storage and Smart Grids.....
32.10.Policy and Economics of Clean Energy.....
32.11Ecological Impact of Renewable Energy.....
32.12.Future Directions in Clean Energy and Ecotechnology.....
2.1 Clean Energy Technology: Ecotechnology Applications.....
32.3 Introduction to Clean Energy and Ecotechnology .....
32.4 Solar Energy Technologies.....
32.5 Wind Energy Systems.....
32.6 Bioenergy and Biomass.....
32.7 Hydropower and Ocean Energy.....
32.8 Geothermal Energy.....
32.9 Energy Storage and Smart Grids.....
32.10 Policy and Economics of Clean Energy.....
32.11 Ecological Impact of Renewable Energy.....

32.12 Future Directions in Clean Energy and Ecotechnology.....
33.Topics.....
33.1Integration of Electronic Engineering in Construction and Civil Engineering.....
33.2.Introduction to Electronic Systems in Civil Engineering.....
33.3.Smart Construction Technologies.....
33.4.IoT in Infrastructure Management.....
33.5.Electronic Monitoring and Control Systems.....
33.6.Automation in Construction Machinery.....
33.7.Solar and Renewable Energy Systems in Civil Engineering.....
33.8.Building Information Modeling (BIM) and Electronic Systems.....
33.9.Cybersecurity in Smart Infrastructure.....
33.1 Integration of Electronic Engineering in Construction and Civil Engineering.....
33.2 Introduction to Electronic Systems in Civil Engineering.....
33.3 Smart Construction Technologies.....
33.4 IoT in Infrastructure Management.....
33.5 Electronic Monitoring and Control Systems.....
33.6 Automation in Construction Machinery.....
33.7 Solar and Renewable Energy Systems in Civil Engineering.....
33.8 Building Information Modeling (BIM) and Electronic Systems.....
33.9 Cybersecurity in Smart Infrastructure.....
34.1.Topic.....
34.2.Masters in Immutable Data Storage Solutions for Web Design.....
34.3.Introduction to Immutable Data.....
33.4.Immutable Data Structures.....
33.5.Immutable.js and Alternatives.....

33.6.State Management with Immutable Data.....
33.7.Performance Benefits of Immutable Data.....
33.8.GraphQL and Immutable Data.....
33.9.Immutable Data in Server-Side Rendering (SSR) .....
33.10.Security and Immutable Data.....
33.11.Future Trends in Immutable Data.....
Masters in Immutable Data Storage Solutions for Web Design.....
34.2 Introduction to Immutable Data.....
34.3 Immutable Data Structures.....
34.4.....
34.Topic.....
34.1.Masters in Immutable Data Storage Solutions for Web Design.....
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34.8.Security and Immutable Data.....
34.9.Future Trends in Immutable Data.....
34.1 Masters in Immutable Data Storage Solutions for Web Design.....
34.2 Introduction to Immutable Data.....
34.3 Immutable Data Structures.....
34.4.....
35.1.Topic.....
35.2.Advanced Cyber-Physical Systems in Telecommunications.....
35.3.Introduction to Cyber-Physical Systems.....

35.4.Network Architecture in CPS.....
35.5..IoT and Cyber-Physical Systems.....
35.6.Security and Privacy in CPS.....
35.7.Real-time Data Processing and Analytics.....
35.8.Machine Learning in Cyber-Physical Systems.....
35.9.Emerging Trends in CPS and Telecommunications .....
35.10.CPS Case Studies in Telecommunications.....
35.2 Advanced Cyber-Physical Systems in Telecommunications.....
35.3 Introduction to Cyber-Physical Systems.....
35.4 Network Architecture in CPS.....
35.5 IoT and Cyber-Physical Systems.....
35.6 Security and Privacy in CPS.....
35.7 Real-time Data Processing and Analytics.....
35.8 Machine Learning in Cyber-Physical Systems.....
35.9 Emerging Trends in CPS and Telecommunications .....
35.10 CPS Case Studies in Telecommunications.....
----------.....
38. Topics:.....
39. Master's Program in Artificial Intelligence and Machine Learning for Software Engineering.....
36.1.Introduction to Artificial Intelligence and Machine Learning.....
36.2.Data Preprocessing and Feature Engineering.....
36.3.Supervised Learning Techniques.....
36.4.Unsupervised Learning and Clustering.....
36.5.Deep Learning and Neural Networks.....
36.6.Natural Language Processing.....
36.7.AI/ML in Software Development Lifecycle.....
36.8.Ethical and Responsible AI.....
36.8.Deployment and Scaling of AI Solutions.....

37.1 Master's Program in Artificial Intelligence and Machine Learning for Software Engineering.....

37.2 Introduction to Artificial Intelligence and Machine Learning.....

37.3 Data Preprocessing and Feature Engineering.....

37.4 Supervised Learning Techniques.....

37.5 Unsupervised Learning and Clustering.....

37.6 Deep Learning and Neural Networks.....

37.7 Natural Language Processing.....

37.8 AI/ML in Software Development Lifecycle.....

37.9 Ethical and Responsible AI.....

37.10 Deployment and Scaling of AI Solutions.....

37..Topics:.....

37.1.Advanced Studies in Autonomous Vehicles and Drones for Electric Vehicle Engineering.....

37.1.Introduction to Autonomous Systems.....

37.2Electric Vehicle Engineering Basics.....

37.3.Sensor Technologies and Data Processing.....

37.4.Machine Learning and AI for Autonomous Systems .....

37.5.Communication Networks and IoT.....

37.6.Control Systems for Autonomous Vehicles.....

37.7Ethical and Regulatory Aspects.....

37.8.Testing and Validation of Autonomous Systems.....

37.9.Integration of Renewable Energy in Autonomous Systems.....

37.1 Advanced Studies in Autonomous Vehicles and Drones for Electric Vehicle Engineering.....

37.2 Introduction to Autonomous Systems.....

37.3 Electric Vehicle Engineering Basics.....

37.4 Sensor Technologies and Data Processing.....

37.5 Machine Learning and AI for Autonomous Systems .....

37.6 Communication Networks and IoT.....

37.7 Control Systems for Autonomous Vehicles.....
37.8 Ethical and Regulatory Aspects.....
37.9 Testing and Validation of Autonomous Systems .....
37.10 Integration of Renewable Energy in Autonomous Systems.....
38.1.topics.....
38.2:Specialist Engineering in Infrastructure and Contractors: Electrochemical Engineering.....
38.3.Introduction to Electrochemical Engineering.....
38.4.Battery Technologies for Infrastructure.....
38.5.Fuel Cells and Their Applications.....
38.6.and Its Prevention.....
38.7..Electrochemical Sensors and Monitoring.....
38.8.Electrolysis and Industrial Processes.....
38.9.Sustainability and Electrochemical Engineering.....
.38.10.Advanced Topics in Electrochemical Engineering .....
38.2 Specialist Engineering in Infrastructure and Contractors: Electrochemical Engineering.....
38.3 Introduction to Electrochemical Engineering.....
38.4 Battery Technologies for Infrastructure.....
38.5 Fuel Cells and Their Applications.....
38.6 Corrosion and Its Prevention.....
38.7 Electrochemical Sensors and Monitoring.....
38.8 Electrolysis and Industrial Processes.....
38.9 Sustainability and Electrochemical Engineering .....
38.10 Advanced Topics in Electrochemical Engineering .....
40.1Topics:Energy Storage and Battery Technology.....
40.2.Introduction to Energy Storage Systems.....
40.3.Battery Chemistry and Physics.....
40.4.Design and Functionality of Battery Cells.....

40.5.Applications of Battery Storage.....
40.6.Efficiency and Performance Measurements.....
40.7.Safety and Environmental Impacts.....
40.8.Advanced Energy Storage Technologies.....
40.9.Policy and Economics of Energy Storage.....
40.10.Future Trends in Battery Technology.....
41.1.Topics:.....
41.2.Advanced Robotic Process Automation in Electrical Engineering.....
41.3.Introduction to Robotic Process Automation.....
41.4.RPA Tools and Technologies.....
41.5.Automating Electrical Design Processes.....
41.6.Data Migration and Management.....
41.7.RPA in Control Systems.....
41.8.Machine Learning and RPA.....
41.9.RPA and IoT in Electrical Systems.....
41.10.Security and Ethics in RPA.....
1.2 Advanced Robotic Process Automation in Electrical Engineering.....
41.3 Introduction to Robotic Process Automation.....
41.4 RPA Tools and Technologies.....
41.5 Automating Electrical Design Processes.....
41.6 Data Migration and Management.....
41.7 RPA in Control Systems.....
41.8 Machine Learning and RPA.....
41.9 RPA and IoT in Electrical Systems.....
41.10 Security and Ethics in RPA.....
44..1. Define the Problem.....
2. Develop the Mathematical Model.....
3. Simplify the Equations.....
4. Analytical Solution (if possible).....
5. Numerical Solution (if necessary).....
6. Simulation and Validation.....

7. Optimization (if applicable).....

Example Calculation: Load Flow Analysis in Power Systems.....

1. Circuit Analysis.....

2. Electromagnetics.....

3. Signal Processing.....

4. Control Systems.....

5. Power Systems.....

6. Electronics.....

7. Digital Systems.....

8. Communication Systems.....

9. Renewable Energy Systems.....

1. Circuit Analysis.....

2. Electromagnetics.....

3. Signal Processing.....

4. Control Systems.....

5. Power Systems.....

6. Electronics.....

7. Digital Systems.....

8. Communication Systems.....

9. Renewable Energy Systems.....

. Circuit Design and Analysis.....

2. Power Systems Engineering.....

3. Control Systems.....

4. Communication Systems.....

5. Electronics and Semiconductor Design.....

6. Renewable Energy Systems.....

7. Building and Infrastructure.....

8. Biomedical Engineering.....

1. Signal Processing.....

2. Communication Systems.....

3. Information Theory.....

4. Network Theory.....
5. Electromagnetic Theory.....
6. Digital Communication.....
1. Signal Processing.....
2. Communication Systems.....
3. Information Theory.....
4. Network Theory.....
5. Electromagnetic Theory.....
6. Digital Communication.....
Practical Examples:.....
IoT (Internet of Things).....
Solar Power Systems.....
Wind Energy Projects.....
Communication Systems Calculations.....
1. MIMO (Multiple Input Multiple Output) Systems.....
2. Satellite Communication.....
3. Optical Fiber Communication.....
4. IoT (Internet of Things).....
Ancient Times.....
System Design and Operation.....
Battery Technologies for Infrastructure.....
34.6 Performance Benefits of Immutable Data.....
38.7 Electrochemical Sensors and Monitoring.....
38.8 Electrolysis and Industrial Processes.....
38.9 Sustainability and Electrochemical Engineering .....
5. Automating Electrical Design Processes.....
Integral and Derivative Calculations in Automating Electrical Design Processes.....
Project Management in Electrical Engineering.....
Integral and Derivative Calculations in Project Management.....
Wind Energy, Solar Energy, and Hydroelectric Power

.....

Electrical Infrastructure Design and Management.....

Smart Grids and IoT Applications.....

Understanding the Basic Concepts of Social Media Marketing.....

Television and Radio Production Essentials.....

Roberto Aldrett - AIU.....

Career Coach.....

Life-Coach Consulting.....

Master in Modern Power and Energy Systems.....

Master in Renewable Energy.....

Bibliographic Resources.....

The Future Of Science and Engineering.....

The Constantly Changing Education Landscape.....

Academic Freedom to Discover Your Purpose Open Curriculum Design at Atlantic International University .....

Core Courses and Topics in Engineering Systems:.....

Orientation Courses:.....

Research Project in Engineering Systems:.....

Academic Freedom to Discover Your Purpose Open Curriculum Design at Atlantic International University .....

Core Courses and Topics in Engineering Systems:.....

Orientation Courses:.....

Research Project in Engineering Systems:.....

Academic Freedom to Discover Your Purpose Open Curriculum Design at Atlantic International University .....

Core Courses and Topics in Engineering Systems:.....

Orientation Courses:.....

Research Project in Engineering Systems:.....

Courses and Topics in Doctorate in Electrical Engineering.....

Orientation Course.....

Research Projects in Doctorate in Electrical Engineering .....

Thesis. Degree honor, council quality rules low become justice development court and labor relations conciliation mediation, Engineering electrical trade research policy skill ,safety security order develop ,defense order.....

Contact Information and Admission call – Atlantic International University.....

Course Ciriculum Total Course Thesis Alumine(1).....

Reviews (1).....

Re: FW: Article submission received #TrackingId:21365851.....

Your article submission 161981.....

editorial@f1000research.com.....

Value Streams Dashboard

Track key DevSecOps metrics throughout the development lifecycle. Learn more.

Background aggregation not enabled

To see usage overview, you must enable background aggregation.

Usage overview for the thesis honor degre engineering and education technologie project

E

Project

engineering tshingombe / thesis honor degre engineering and education technologie

Issues

-

Merge requests

-

Pipelines

-

Lifecycle metrics for the thesis honor degre engineering and education technologie project

Metric	December Dec 1 - Dec 31	January Jan 1 - Jan 31	Month to date Feb 1 - Feb 13	Past 6 Months Aug 13 - Feb 13
Lead time	-	-	-	
Cycle time	-	-	-	
Issues created	-	-	1	
Issues closed	-	-	-	

Deploys	- - -
Merge request throughput	- - -
Median time to merge	- - -

DORA metrics for the thesis honor degre engineering and education technologie project

Metric	December Dec 1 - Dec 31	January Jan 1 - Jan 31	Month to date Feb 1 - Feb 13	Past 6 Months Aug 13 - Feb 13
Deployment frequency	0.0/d	0.0/d	0.0/d	
Lead time for changes	0.0 d	0.0 d	0.0 d	
Time to restore service	0.0 d	0.0 d	0.0 d	
Change failure rate	0.0 %	0.0 %	0.0 %	

Security metrics for the thesis honor degre engineering and education technologie project

Metric	December Dec 1 - Dec 31	January Jan 1 - Jan 31	Month to date Feb 1 - Feb 13	Past 6 Months Aug 13 - Feb 13
Critical vulnerabilities over time	-	-	-	
High vulnerabilities over time	-	-		

1. engineering tshingombe
2. thesis honor degre engineering and education technologie
3. Issue Analytics

Issue Analytics

窗体顶端

窗体底端

窗体顶端

-

窗体底端

Overview

Opened

Avg: 76.9m · Max: 1

Closed

Avg: 0 · Max: 0

Issue	Age	Status	Milestone	Iteration	Weight	Due date	Assignees	Created by
thesisi engineering project • #1	9 days	Opened						

1. engineering tshingombe
2. thesis honor degre engineering and education technologie
3. Insights

Insights

Configure a custom report for insights into your group processes such as amount of issues, bugs, and merge requests per month. How do I configure an insights report?

Issues Dashboard

Issues created per month

Issues closed per month

Bugs created per month by Priority

December 2024

undefined

0

P::4

0

P::3

0

P::2

0

P::1

0

P::1

Avg: 0 · Max: 0

P::2

Avg: 0 · Max: 0

P::3

Avg: 0 · Max: 0

P::4

Avg: 0 · Max: 0

undefined

Avg: 0 · Max: 0

Bugs created per month by Severity

S::1

Avg: 0 · Max: 0

S::2

Avg: 0 · Max: 0

S::3

Avg: 0 · Max: 0

S::4

Avg: 0 · Max: 0

undefined

Avg: 0 · Max: 0

- All
- Push events
- Merge events
- Issue events
- Comments
- Wiki
- Designs
- Team

8 minutes ago

Kananga5 @Kananga5
pushed to branch main

- 47248643 · Update .gitlab-ci.yml

10 minutes ago

Kananga5 @Kananga5
pushed new tag e
14 minutes ago

Kananga5 @Kananga5
opened test_case #3 "engineerinf"
17 minutes ago

Kananga5 @Kananga5
opened merge request !1 "Update .gitlab-ci.yml file,3"
20 minutes ago

Kananga5 @Kananga5
pushed new branch main2
23 minutes ago

Kananga5 @Kananga5
created wiki page homeengineering thesis
25 minutes ago

Kananga5 @Kananga5
opened issue #2 "doctoract thesis"
29 minutes ago

Kananga5 @Kananga5
pushed to branch main

- 0e6de252 · Edit README.mdeng

1 week ago

Kananga5 @Kananga5
opened milestone %thesis engineering
1 week ago

Kananga5 @Kananga5
opened issue #1 "thesisi engineering project"
1 week ago

Kananga5 @Kananga5
pushed new branch main
1 week ago

Kananga5 @Kananga5
pushed to branch main

- f20a39bf · Configure SAST in `.gitlab-ci.yml`, creating this file if it does n...

1 week ago

Kananga5 @Kananga5
created project engineering tshingombe / thesis hon

Status	Pipeline	Created by	Stages	Actions
Failed 9 minutes ago	Update .gitlab-ci.yml #1669384720 main 47248643 latest yaml invalid error			

Failed 19 minutes ago	Update .gitlab-ci.yml file,3 #1669365463 1 11ea2662 latest yaml invalid error merge request		
Failed 21 minutes ago	Update .gitlab-ci.yml file,3 #1669360850 main2 11ea2662 latest yaml invalid error		

· All 1
· Active
· Inactive

Description (Click to sort ascending)	Interval	Target (Click to sort ascending)	Last Pipeline	Next Run (Click to sort ascending)	Owner
engineering	28 1 * * * Pacific/Pago_Pago				

1. thesis-honor-degre-engineering-and-education-technologie
2.

1.

thesis-honor-degre-engineering-and-education-technologie

Update .gitlab-ci.yml file

Kananga5 authored 2 minutes ago

bb368b4c

Name	Last commit	Last update
.gitlab-ci.yml	Update .gitlab-ci.yml file	2 minutes ago
README.md	Initial commit	1 week ago

README.md

thesis honor degre engineering and education technologie

Getting started

To make it easy for you to get started with GitLab, here's a list of recommended next steps.

Already a pro? Just edit this README.md and make it your own. Want to make it easy? Use the template at the bottom!

Add your files

- Create or upload files
- Add files using the command line or push an existing Git repository with the following command:

```
cd existing_repo
git remote add origin https://gitlab.com/engineering-tshingombe/thesis-honor-degre-engineering-and-education-technologie.git
git branch -M main
git push -uf origin main
```

Integrate with your tools

- Set up project integrations

Collaborate with your team

- Invite team members and collaborators
- Create a new merge request
- Automatically close issues from merge requests
- Enable merge request approvals
- Set auto-merge

Test and Deploy

Use the built-in continuous integration in GitLab.

- Get started with GitLab CI/CD
- Analyze your code for known vulnerabilities with Static Application Security Testing (SAST)
- Deploy to Kubernetes, Amazon EC2, or Amazon ECS using Auto Deploy
- Use pull-based deployments for improved Kubernetes management
- Set up protected environments

Editing this README

When you're ready to make this README your own, just edit this file and use the handy template below (or feel free to structure it however you want - this is just a starting point!). Thanks to makeareadme.com for this template.

Suggestions for a good README

Every project is different, so consider which of these sections apply to yours. The sections used in the template are suggestions for most open source projects. Also keep in mind that while a README can be too long and detailed, too long is better than too short. If you think your README is too long, consider utilizing another form of documentation rather than cutting out information.

Name

Choose a self-explaining name for your project.

Description

Let people know what your project can do specifically. Provide context and add a link to any reference visitors might be unfamiliar with. A list of Features or a Background subsection can also be added here. If there are alternatives to your project, this is a good place to list differentiating factors.

Badges

On some READMEs, you may see small images that convey metadata, such as whether or not all the tests are passing for the project. You can use Shields to add some to your README. Many services also have instructions for adding a badge.

Visuals

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Use examples liberally, and show the expected output if you can. It's helpful to have inline the smallest example of usage that you can demonstrate, while providing links to more sophisticated examples if they are too long to reasonably include in the README.

Support

Tell people where they can go to for help. It can be any combination of an issue tracker, a chat room, an email address, etc.

Roadmap

If you have ideas for releases in the future, it is a good idea to list them in the README.

Contributing

State if you are open to contributions and what your requirements are for accepting them.

For people who want to make changes to your project, it's helpful to have some documentation on how to get started. Perhaps there is a script that they should run or some environment variables that they need to set. Make these steps explicit. These instructions could also be useful to your future self.

You can also document commands to lint the code or run tests. These steps help to ensure high code quality and reduce the likelihood that the changes inadvertently break something. Having instructions for running tests is

especially helpful if it requires external setup, such as starting a Selenium server for testing in a browser.

Authors and acknowledgment

Show your appreciation to those who have contributed to the project.

License

For open source projects, say how it is licensed.

Project status

If you have run out of energy or time for your project, put a note at the top of the README saying that development has slowed down or stopped completely. Someone may choose to fork your project or volunteer to step in as a maintainer or owner, allowing your project to keep going. You can also make an explicit request for m

- Kananga5
- Curriculum-section-1-1.1-Thesis.-Degree-honor-council-quality-rules-low-become-ju
-

· Code
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· Issues 5
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· Discussions
·
· Actions
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· Projects 1
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· Wiki

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· Security

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· Insights

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- Settings

Files

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workflows

-

· azure-webapps-node.yml
· · blank.yml
· · generator-generic-ossf-slsa3-publish.yml
· · ibm.yml
· · mdbook.yml

- · ·

static.yml

· · EXTENSION E-MAIL.pdf
· · FUNDING.yml
· · FormSubmission-request-ip-licencemip-67-25-0100-000.pdf
· · Request for extension of visa template - Amended.docx
· · SBIR-STTR Submitted Project Pitch.pdf
· · Weekly Office Schedule.docx

· · course ciriculum total course thesis alumine.docx

· · e

· · report1738657689944.xls

- · ·

report1738657922688.xls

· · .gitignore
· · LICENSE

- ·

README.md

1. Curriculum-section-1-1.1-Thesis.-Degree-honor-council-quality-rules-low-become-ju
2. /.github

/

workflows

/

Kananga5

Create mdbook.ymleng

0bebd64 · Feb 13, 2025

Name	Last commit message	Last commit date

..

azure-webapps-node.yml	Create azure-webapps-node.yml.tshing	Jan 30, 2025
blank.yml	Create blank.yml.engin	Jan 30, 2025
generator-generic-ossf-slsa3-publish.yml	Create generator-generic-ossf-slsa3-publish.ymlen	Feb 4, 2025
ibm.yml	Create ibm.yml,tshing	Jan 30, 2025
mdbook.yml	Create mdbook.ymleng	Feb 13, 2025
static.yml	Create static.yml	

1 file changed

+78

-0

lines changed

Customizable line height

The default line height has been increased for improved accessibility. You can choose to enable a more compact line height from the view settings menu.

.github/workflows/azure-webapps-node.yml

+78

-

· **Original file line number** **Diff line number** **Diff line change**

```
@@ -0,0 +1,78 @@

# This workflow will build and push a node.js application to an Azure Web App when a commit is pushed to your default branch.

#

# This workflow assumes you have already created the target Azure App Service web app.

# For instructions see https://docs.microsoft.com/en-us/azure/app-service/quickstart-nodejs?tabs=linux&pivots=development-environment-cli

#

# To configure this workflow:

#

# 1. Download the Publish Profile for your Azure Web App. You can download this file from the Overview page of your Web App in the Azure Portal.

# For more information: https://docs.microsoft.com/en-us/azure/app-service/deploy-github-actions?tabs=applevel#generate-deployment-credentials
```

```
#

# 2. Create a secret in your repository named AZURE_WEBAPP_PUBLISH_PROFILE,
paste the publish profile contents as the value of the secret.

# For instructions on obtaining the publish profile see:
https://docs.microsoft.com/azure/app-service/deploy-github-actions#configure-
the-github-secret

#

# 3. Change the value for the AZURE_WEBAPP_NAME. Optionally, change the
AZURE_WEBAPP_PACKAGE_PATH and NODE_VERSION environment variables below.

#

# For more information on GitHub Actions for Azure:
https://github.com/Azure/Actions

# For more information on the Azure Web Apps Deploy action:
https://github.com/Azure/webapps-deploy

# For more samples to get started with GitHub Action workflows to deploy to
Azure: https://github.com/Azure/actions-workflow-samples



on:

push:
```

```
branches: [ "main" ]

workflow_dispatch:



env:

AZURE_WEBAPP_NAME: your-app-name # set this to your application's name

AZURE_WEBAPP_PACKAGE_PATH: '.' # set this to the path to your web app
project, defaults to the repository root

NODE_VERSION: '20.x' # set this to the node version to use



permissions:

contents: read



jobs:

build:

runs-on: ubuntu-latest

steps:
```

```
- uses: actions/checkout@v4



- name: Set up Node.js

uses: actions/setup-node@v4

with:

node-version: ${{ env.NODE_VERSION }}

cache: 'npm'



- name: npm install, build, and test

run: |

npm install

npm run build --if-present

npm run test --if-present



- name: Upload artifact for deployment job

uses: actions/upload-artifact@v4
```

```
with:

name: node-app

path: .



deploy:

permissions:

contents: none

runs-on: ubuntu-latest

needs: build

environment:

name: 'Development'

url: ${{ steps.deploy-to-webapp.outputs.webapp-url }}



steps:

- name: Download artifact from build job
```

```
uses: actions/download-artifact@v4

with:

name: node-app



- name: 'Deploy to Azure WebApp'

id: deploy-to-webapp

uses: azure/webapps-deploy@v2

with:

app-name: ${{ env.AZURE_WEBAPP_NAME }}

publish-profile: ${{ secrets.AZURE_WEBAPP_PUBLISH_PROFILE }}

package: ${{ env.AZURE_WEBAPP_PACKAGE_PATH }}
```

This is a basic workflow to help you get started with Actions

name: CI

Controls when the workflow will run

on:

```
  # Triggers the workflow on push or pull request events but only for the "main" branch
  push:
    branches: [ "main" ]
  pull_request:
    branches: [ "main" ]


  # Allows you to run this workflow manually from the Actions tab
  workflow_dispatch:


# A workflow run is made up of one or more jobs that can run sequentially or in parallel
jobs:
  # This workflow contains a single job called "build"
  build:
    # The type of runner that the job will run on
    runs-on: ubuntu-latest


    # Steps represent a sequence of tasks that will be executed as part of the job
    steps:
      # Checks-out your repository under $GITHUB_WORKSPACE, so your job can access it
      - uses: actions/checkout@v4


      # Runs a single command using the runners shell
      - name: Run a one-line script
        run: echo Hello, world!


      # Runs a set of commands using the runners shell
```

```
      - name: Run a multi-line script
        run: |
          echo Add other actions to build,
          echo test, and deploy your project.
# This workflow uses actions that are not certified by GitHub.
# They are provided by a third-party and are governed by
# separate terms of service, privacy policy, and support
# documentation.

# This workflow lets you generate SLSA provenance file for your project.
# The generation satisfies level 3 for the provenance requirements - see https://slsa.dev/spec/v0.1/requirements
# The project is an initiative of the OpenSSF (openssf.org) and is developed at
# https://github.com/slsa-framework/slsa-github-generator.
# The provenance file can be verified using https://github.com/slsa-framework/slsa-verifier.
# For more information about SLSA and how it improves the supply-chain, visit slsa.dev.

name: SLSA generic generator
on:
  workflow_dispatch:
  release:
    types: [created]

jobs:
  build:
    runs-on: ubuntu-latest
    outputs:
```

```
    digests: ${{ steps.hash.outputs.digests }}

  steps:
    - uses: actions/checkout@v4

    # ====================================================
    #
    # Step 1: Build your artifacts.
    #
    # ====================================================
    - name: Build artifacts
      run: |
        # These are some amazing artifacts.
        echo "artifact1" > artifact1
        echo "artifact2" > artifact2

    # ====================================================
    #
    # Step 2: Add a step to generate the provenance subjects
    #       as shown below. Update the sha256 sum arguments
    #       to include all binaries that you generate
    #       provenance for.
    #
```

```
    #
==========================================================
==========
    - name: Generate subject for provenance
      id: hash
      run: |
        set -euo pipefail


        # List the artifacts the provenance will refer to.
        files=$(ls artifact*)
        # Generate the subjects (base64 encoded).
        echo "hashes=$(sha256sum $files | base64 -w0)" >> "$
{GITHUB_OUTPUT}"


  provenance:
    needs: [build]
    permissions:
      actions: read   # To read the workflow path.
      id-token: write # To sign the provenance.
      contents: write # To add assets to a release.
    uses:
slsa-framework/slsa-github-generator/.github/workflows/generator_generic_sl
sa3.yml@v1.4.0
    with:
      base64-subjects: "${{ needs.build.outputs.digests }}"
      upload-assets: true # Optional: Upload to a new release
# Sample workflow for building and deploying a mdBook site to GitHub
Pages
#
# To get started with mdBook see:
https://rust-lang.github.io/mdBook/index.html
```

```
#
name: Deploy mdBook site to Pages

on:
  # Runs on pushes targeting the default branch
  push:
    branches: ["main"]

  # Allows you to run this workflow manually from the Actions tab
  workflow_dispatch:

# Sets permissions of the GITHUB_TOKEN to allow deployment to GitHub Pages
permissions:
  contents: read
  pages: write
  id-token: write

# Allow only one concurrent deployment, skipping runs queued between the run in-progress and latest queued.
# However, do NOT cancel in-progress runs as we want to allow these production deployments to complete.
concurrency:
  group: "pages"
  cancel-in-progress: false

jobs:
  # Build job
  build:
```

```
    runs-on: ubuntu-latest
    env:
      MDBOOK_VERSION: 0.4.36
    steps:
      - uses: actions/checkout@v4
      - name: Install mdBook
        run: |
          curl --proto '=https' --tlsv1.2 https://sh.rustup.rs -sSf -y | sh
          rustup update
          cargo install --version ${MDBOOK_VERSION} mdbook
      - name: Setup Pages
        id: pages
        uses: actions/configure-pages@v5
      - name: Build with mdBook
        run: mdbook build
      - name: Upload artifact
        uses: actions/upload-pages-artifact@v3
        with:
          path: ./book

  # Deployment job
  deploy:
    environment:
      name: github-pages
      url: ${{ steps.deployment.outputs.page_url }}
    runs-on: ubuntu-latest
    needs: build
    steps:
```

```
    - name: Deploy to GitHub Pages
      id: deployment
      uses: actions/deploy-pages@v4
```

@Kananga5's untitled project

Backlog

Team capacity

Current iteration

Roadmap

My items

View 6

thesis

0 (0) matching items

Todo

0 / 5 (0 / 5)

Estimate: 0

This item hasn't been started

In Progress

0 / 5 (0 / 5)

Estimate: 0

This is actively being worked on

Done

0 (0)

Estimate: 0

This has been completed

Value Streams Dashboard

Track key DevSecOps metrics throughout the development lifecycle. Learn more.

Background aggregation not enabled

To see usage overview, you must enable background aggregation.

Usage overview for the thesis honor degre engineering and education technologie project

E

Project

engineering tshingombe / thesis honor degre engineering and education technologie

Issues

-

Merge requests

-

Pipelines

-

Lifecycle metrics for the thesis honor degre engineering and education technologie project

Metric	December Dec 1 - Dec 31	January Jan 1 - Jan 31	Month to date Feb 1 - Feb 13	Past 6 Months Aug 13 - Feb 13
Lead time	-	-	-	
Cycle time	-	-	-	

Issues created	-	-	1
Issues closed	-	-	-
Deploys	-	-	-
Merge request throughput	-	-	-
Median time to merge	-	-	-

DORA metrics for the thesis honor degre engineering and education technologie project

Metric	December Dec 1 - Dec 31	January Jan 1 - Jan 31	Month to date Feb 1 - Feb 13	Past 6 Months Aug 13 - Feb 13
Deployment frequency	0.0/d	0.0/d	0.0/d	
Lead time for changes	0.0 d	0.0 d	0.0 d	
Time to restore service	0.0 d	0.0 d	0.0 d	

Change failure rate	0.0 %	0.0 %	0.0 %

Security metrics for the thesis honor degre engineering and education technologie project

Metric	December Dec 1 - Dec 31	January Jan 1 - Jan 31	Month to date Feb 1 - Feb 13	Past 6 Months Aug 13 - Feb 13
Critical vulnerabilities over time	-	-	-	
High vulnerabilities over time	-	-		

1. engineering tshingombe
2. thesis honor degre engineering and education technologie
3. Issue Analytics

Issue Analytics

窗体顶端

窗体底端

窗体顶端

-

窗体底端

Overview

Opened

Avg: 76.9m · Max: 1

Closed

Avg: 0 · Max: 0

Issue	Age	Status	Milestone	Iteration	Weight	Due date	Assignees	Created by
thesisi engineering project • #1	9 days	Opened						

1. engineering tshingombe
2. thesis honor degre engineering and education technologie
3. Insights

Insights

Configure a custom report for insights into your group processes such as amount of issues, bugs, and merge requests per month. How do I configure an insights report?

Issues Dashboard

Issues created per month

Issues closed per month

Bugs created per month by Priority

December 2024

undefined

0

P::4

0

P::3

0

P::2

0

P::1

0

P::1

Avg: 0 · Max: 0

P::2

Avg: 0 · Max: 0

P::3

Avg: 0 · Max: 0

P::4

Avg: 0 · Max: 0

undefined

Avg: 0 · Max: 0

Bugs created per month by Severity

S::1

Avg: 0 · Max: 0

S::2

Avg: 0 · Max: 0

S::3

Avg: 0 · Max: 0

S::4

Avg: 0 · Max: 0

undefined

Avg: 0 · Max: 0

- All
- Push events
- Merge events
- Issue events
- Comments
- Wiki
- Designs
- Team

8 minutes ago

Kananga5 @Kananga5
pushed to branch main

- 47248643 · Update .gitlab-ci.yml

10 minutes ago

Kananga5 @Kananga5
pushed new tag e
14 minutes ago

Kananga5 @Kananga5
opened test_case #3 "engineerinf"
17 minutes ago

Kananga5 @Kananga5
opened merge request !1 "Update .gitlab-ci.yml file,3"
20 minutes ago

Kananga5 @Kananga5
pushed new branch main2
23 minutes ago

Kananga5 @Kananga5
created wiki page homeengineering thesis
25 minutes ago

Kananga5 @Kananga5
opened issue #2 "doctoract thesis"
29 minutes ago

Kananga5 @Kananga5
pushed to branch main

- 0e6de252 · Edit README.mdeng

1 week ago

Kananga5 @Kananga5
opened milestone %thesis engineering
1 week ago

Kananga5 @Kananga5
opened issue #1 "thesisi engineering project"
1 week ago

Kananga5 @Kananga5
pushed new branch main
1 week ago

Kananga5 @Kananga5
pushed to branch main

- f20a39bf · Configure SAST in `.gitlab-ci.yml`, creating this file if it does n...

1 week ago

Kananga5 @Kananga5
created project engineering tshingombe / thesis hon

Status	Pipeline	Created by	Stages	Actions
Failed 9 minutes ago	Update .gitlab-ci.yml #1669384720 main 47248643 latest yaml invalid error			
Failed 19 minutes ago	Update .gitlab-ci.yml file,3 #1669365463 1 11ea2662 latest yaml invalid error merge request			
Failed 21 minutes ago	Update .gitlab-ci.yml file,3 #1669360850 main2 11ea2662 latest yaml invalid error			

- All 1
- Active
- Inactive

Description (Click to sort ascending)	Interval	Target (Click to sort ascending)	Last Pipeline	Next Run (Click to sort ascending)	Owner
engineering	28 1 * * * Pacific/Pago_Pago				

1. thesis-honor-degre-engineering-and-education-technologie
2.

1.

thesis-honor-degre-engineering-and-education-technologie

Update .gitlab-ci.yml file

Kananga5 authored 2 minutes ago

bb368b4c

Name	Last commit	Last update
.gitlab-ci.yml	Update .gitlab-ci.yml file	2 minutes ago
README.md	Initial commit	1 week ago

README.md

thesis honor degre engineering and education technologie

Getting started

To make it easy for you to get started with GitLab, here's a list of recommended next steps.

Already a pro? Just edit this README.md and make it your own. Want to make it easy? Use the template at the bottom!

Add your files

- Create or upload files
- Add files using the command line or push an existing Git repository with the following command:

```
cd existing_repo
git remote add origin https://gitlab.com/engineering-tshingombe/thesis-honor-degre-engineering-and-education-technologie.git
git branch -M main
git push -uf origin main
```

Integrate with your tools

- Set up project integrations

Collaborate with your team

- Invite team members and collaborators
- Create a new merge request
- Automatically close issues from merge requests
- Enable merge request approvals
- Set auto-merge

Test and Deploy

Use the built-in continuous integration in GitLab.

- Get started with GitLab CI/CD

- Analyze your code for known vulnerabilities with Static Application Security Testing (SAST)
- Deploy to Kubernetes, Amazon EC2, or Amazon ECS using Auto Deploy
- Use pull-based deployments for improved Kubernetes management
- Set up protected environments

Editing this README

When you're ready to make this README your own, just edit this file and use the handy template below (or feel free to structure it however you want - this is just a starting point!). Thanks to makeareadme.com for this template.

Suggestions for a good README

Every project is different, so consider which of these sections apply to yours. The sections used in the template are suggestions for most open source projects. Also keep in mind that while a README can be too long and detailed, too long is better than too short. If you think your README is too long, consider utilizing another form of documentation rather than cutting out information.

Name

Choose a self-explaining name for your project.

Description

Let people know what your project can do specifically. Provide context and add a link to any reference visitors might be unfamiliar with. A list of Features or a Background subsection can also be added here. If there are alternatives to your project, this is a good place to list differentiating factors.

Badges

On some READMEs, you may see small images that convey metadata, such as whether or not all the tests are passing for the project. You can use Shields to add some to your README. Many services also have instructions for adding a badge.

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If you have run out of energy or time for your project, put a note at the top of the README saying that development has slowed down or stopped completely. Someone may choose to fork your project or volunteer to step in as a maintainer or owner, allowing your project to keep going. You can also make an explicit request for m

- Kananga5
- Curriculum-section-1-1.1-Thesis.-Degree-honor-council-quality-rules-low-become-ju
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· Code
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· Issues 5

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· Pull requests

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· Discussions

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· Actions

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· Projects 1

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· Wiki

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· Security

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· Insights

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- Settings

Files

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workflows

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· azure-webapps-node.yml
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· · ibm.yml
· · mdbook.yml

- · ·

  static.yml

  · · EXTENSION E-MAIL.pdf
  · · FUNDING.yml

  · · FormSubmission-request-ip-licencemip-67-25-0100-000.pdf

  · · Request for extension of visa template - Amended.docx

  · · SBIR-STTR Submitted Project Pitch.pdf

  · · Weekly Office Schedule.docx

  · · course ciriculum total course thesis alumine.docx

  · · e

  · · report1738657689944.xls

- · ·

  report1738657922688.xls

  · · .gitignore
  · · LICENSE

  - ·

    README.md

  1. Curriculum-section-1-1.1-Thesis.-Degree-honor-council-quality-rules-low-become-ju
  2. /.github

  /

workflows

/

Kananga5

Create mdbook.ymleng

0bebd64 · Feb 13, 2025

Name	Last commit message	Last commit date
..		
azure-webapps-node.yml	Create azure-webapps-node.yml.tshing	Jan 30, 2025
blank.yml	Create blank.yml.engin	Jan 30, 2025
generator-generic-ossf-slsa3-publish.yml	Create generator-generic-ossf-slsa3-publish.ymlen	Feb 4, 2025
ibm.yml	Create ibm.yml,tshing	Jan 30, 2025
mdbook.yml	Create mdbook.ymleng	Feb 13, 2025
static.yml	Create static.yml	

1 file changed

+78

-0

lines changed

Customizable line height

The default line height has been increased for improved accessibility. You can choose to enable a more compact line height from the view settings menu.

.github/workflows/azure-webapps-node.yml

+78

- ·

Original file line number	Diff line number	Diff line change

```
@@ -0,0 +1,78 @@

# This workflow will build and push a node.js application to an Azure Web App
when a commit is pushed to your default branch.

#

# This workflow assumes you have already created the target Azure App Service
web app.

# For instructions see
https://docs.microsoft.com/en-us/azure/app-service/quickstart-nodejs?
tabs=linux&pivots=development-environment-cli

#
```

```
# To configure this workflow:

#

# 1. Download the Publish Profile for your Azure Web App. You can download
this file from the Overview page of your Web App in the Azure Portal.

# For more information:
https://docs.microsoft.com/en-us/azure/app-service/deploy-github-actions?
tabs=applevel#generate-deployment-credentials

#

# 2. Create a secret in your repository named AZURE_WEBAPP_PUBLISH_PROFILE,
paste the publish profile contents as the value of the secret.

# For instructions on obtaining the publish profile see:
https://docs.microsoft.com/azure/app-service/deploy-github-actions#configure-
the-github-secret

#

# 3. Change the value for the AZURE_WEBAPP_NAME. Optionally, change the
AZURE_WEBAPP_PACKAGE_PATH and NODE_VERSION environment variables below.

#

# For more information on GitHub Actions for Azure:
https://github.com/Azure/Actions

# For more information on the Azure Web Apps Deploy action:
https://github.com/Azure/webapps-deploy
```

```
# For more samples to get started with GitHub Action workflows to deploy to
Azure: https://github.com/Azure/actions-workflow-samples



on:


push:


branches: [ "main" ]


workflow_dispatch:




env:


AZURE_WEBAPP_NAME: your-app-name # set this to your application's name


AZURE_WEBAPP_PACKAGE_PATH: '.' # set this to the path to your web app
project, defaults to the repository root


NODE_VERSION: '20.x' # set this to the node version to use




permissions:


contents: read
```

```
jobs:

build:

runs-on: ubuntu-latest

steps:

- uses: actions/checkout@v4



- name: Set up Node.js

uses: actions/setup-node@v4

with:

node-version: ${{ env.NODE_VERSION }}

cache: 'npm'



- name: npm install, build, and test

run: |

npm install
```

```
npm run build --if-present

npm run test --if-present



- name: Upload artifact for deployment job

uses: actions/upload-artifact@v4

with:

name: node-app

path: .



deploy:

permissions:

contents: none

runs-on: ubuntu-latest

needs: build

environment:
```

```
name: 'Development'

url: ${{ steps.deploy-to-webapp.outputs.webapp-url }}



steps:

- name: Download artifact from build job

uses: actions/download-artifact@v4

with:

name: node-app



- name: 'Deploy to Azure WebApp'

id: deploy-to-webapp

uses: azure/webapps-deploy@v2

with:

app-name: ${{ env.AZURE_WEBAPP_NAME }}

publish-profile: ${{ secrets.AZURE_WEBAPP_PUBLISH_PROFILE }}
```

```
package: ${{ env.AZURE_WEBAPP_PACKAGE_PATH }}
```

This is a basic workflow to help you get started with Actions

name: CI

Controls when the workflow will run

on:

  # Triggers the workflow on push or pull request events but only for the "main" branch

  push:

    branches: ["main"]

  pull_request:

    branches: ["main"]

  # Allows you to run this workflow manually from the Actions tab

  workflow_dispatch:

A workflow run is made up of one or more jobs that can run sequentially or in parallel

jobs:

  # This workflow contains a single job called "build"

  build:

    # The type of runner that the job will run on

    runs-on: ubuntu-latest

    # Steps represent a sequence of tasks that will be executed as part of the job

    steps:

```
    # Checks-out your repository under $GITHUB_WORKSPACE, so your job can access it
    - uses: actions/checkout@v4

    # Runs a single command using the runners shell
    - name: Run a one-line script
      run: echo Hello, world!

    # Runs a set of commands using the runners shell
    - name: Run a multi-line script
      run: |
        echo Add other actions to build,
        echo test, and deploy your project.
# This workflow uses actions that are not certified by GitHub.
# They are provided by a third-party and are governed by
# separate terms of service, privacy policy, and support
# documentation.

# This workflow lets you generate SLSA provenance file for your project.
# The generation satisfies level 3 for the provenance requirements - see https://slsa.dev/spec/v0.1/requirements
# The project is an initiative of the OpenSSF (openssf.org) and is developed at
# https://github.com/slsa-framework/slsa-github-generator.
# The provenance file can be verified using https://github.com/slsa-framework/slsa-verifier.
# For more information about SLSA and how it improves the supply-chain, visit slsa.dev.

name: SLSA generic generator
```

```
on:
  workflow_dispatch:
  release:
    types: [created]

jobs:
  build:
    runs-on: ubuntu-latest
    outputs:
      digests: ${{ steps.hash.outputs.digests }}

    steps:
      - uses: actions/checkout@v4

      #
============================================================
==========
      #
      # Step 1: Build your artifacts.
      #
      #
============================================================
==========
      - name: Build artifacts
        run: |
            # These are some amazing artifacts.
            echo "artifact1" > artifact1
            echo "artifact2" > artifact2
```

```
    #
==========================================================
==========
    #
    # Step 2: Add a step to generate the provenance subjects
    #         as shown below. Update the sha256 sum arguments
    #         to include all binaries that you generate
    #         provenance for.
    #
    #
==========================================================
==========
    - name: Generate subject for provenance
      id: hash
      run: |
        set -euo pipefail


        # List the artifacts the provenance will refer to.
        files=$(ls artifact*)
        # Generate the subjects (base64 encoded).
        echo "hashes=$(sha256sum $files | base64 -w0)" >> "$
{GITHUB_OUTPUT}"


  provenance:
    needs: [build]
    permissions:
      actions: read   # To read the workflow path.
      id-token: write # To sign the provenance.
      contents: write # To add assets to a release.
```

```
    uses: slsa-framework/slsa-github-generator/.github/workflows/generator_generic_slsa3.yml@v1.4.0
    with:
      base64-subjects: "${{ needs.build.outputs.digests }}"
      upload-assets: true # Optional: Upload to a new release
# Sample workflow for building and deploying a mdBook site to GitHub Pages
#
# To get started with mdBook see: https://rust-lang.github.io/mdBook/index.html
#
name: Deploy mdBook site to Pages


on:
  # Runs on pushes targeting the default branch
  push:
    branches: ["main"]


  # Allows you to run this workflow manually from the Actions tab
  workflow_dispatch:


# Sets permissions of the GITHUB_TOKEN to allow deployment to GitHub Pages
permissions:
  contents: read
  pages: write
  id-token: write


# Allow only one concurrent deployment, skipping runs queued between the run in-progress and latest queued.
```

```
# However, do NOT cancel in-progress runs as we want to allow these production deployments to complete.
concurrency:
  group: "pages"
  cancel-in-progress: false

jobs:
  # Build job
  build:
    runs-on: ubuntu-latest
    env:
      MDBOOK_VERSION: 0.4.36
    steps:
      - uses: actions/checkout@v4
      - name: Install mdBook
        run: |
          curl --proto '=https' --tlsv1.2 https://sh.rustup.rs -sSf -y | sh
          rustup update
          cargo install --version ${MDBOOK_VERSION} mdbook
      - name: Setup Pages
        id: pages
        uses: actions/configure-pages@v5
      - name: Build with mdBook
        run: mdbook build
      - name: Upload artifact
        uses: actions/upload-pages-artifact@v3
        with:
          path: ./book
```

```
  # Deployment job
  deploy:
    environment:
      name: github-pages
      url: ${{ steps.deployment.outputs.page_url }}
    runs-on: ubuntu-latest
    needs: build
    steps:
      - name: Deploy to GitHub Pages
        id: deployment
        uses: actions/deploy-pages@v4
```

@Kananga5's untitled project

Backlog

Team capacity

Current iteration

Roadmap

My items

View 6

thesis

0 (0) matching items

Todo

0 / 5 (0 / 5)

Estimate: 0

This item hasn't been started

In Progress

0 / 5 (0 / 5)

Estimate: 0

This is actively being worked on

Done

0 (0)

Estimate: 0

This has been completed

Value Streams Dashboard

Track key DevSecOps metrics throughout the development lifecycle. Learn more.

Background aggregation not enabled

To see usage overview, you must enable background aggregation.

Usage overview for the thesis honor degre engineering and education technologie project

E

Project

engineering tshingombe / thesis honor degre engineering and education technologie

Issues

-

Merge requests

-

Pipelines

-

Lifecycle metrics for the thesis honor degre engineering and education technologie project

Metric	December Dec 1 - Dec 31	January Jan 1 - Jan 31	Month to date Feb 1 - Feb 13	Past 6 Months Aug 13 - Feb 13
Lead time	-	-	-	
Cycle time	-	-	-	
Issues created	-	-	1	
Issues closed	-	-	-	
Deploys	-	-	-	
Merge request throughput		-	-	-
Median time to merge		-	-	-

DORA metrics for the thesis honor degre engineering and education technologie project

Metric	December Dec 1 - Dec 31	January Jan 1 - Jan 31	Month to date Feb 1 - Feb 13	Past 6 Months Aug 13 - Feb 13
Deployment frequency	0.0/d	0.0/d	0.0/d	
Lead time for changes	0.0 d	0.0 d	0.0 d	
Time to restore service	0.0 d	0.0 d	0.0 d	
Change failure rate	0.0 %	0.0 %	0.0 %	

Security metrics for the thesis honor degre engineering and education technologie project

Metric	December Dec 1 - Dec 31	January Jan 1 - Jan 31	Month to date Feb 1 - Feb 13	Past 6 Months Aug 13 - Feb 13
Critical vulnerabilities over time	-	-	-	
High vulnerabilities over time	-	-		

1. engineering tshingombe
2. thesis honor degre engineering and education technologie
3. Issue Analytics

Issue Analytics

□□□□

□□□□

□□□□

-

□□□□

Overview

Opened

Avg: 76.9m · Max: 1

Closed

Avg: 0 · Max: 0

Issue	Age	Status	Milestone	Iteration	Weight	Due date	Assignees	Created by
thesisi engineering project • #1	9 days	Opened						

1. engineering tshingombe
2. thesis honor degre engineering and education technologie
3. Insights

Insights

Configure a custom report for insights into your group processes such as amount of issues, bugs, and merge requests per month. How do I configure an insights report?

Issues Dashboard

Issues created per month

Issues closed per month

Bugs created per month by Priority

December 2024

undefined

0

P::4

0

P::3

0

P::2

0

P::1

0

P::1

Avg: 0 · Max: 0

P::2

Avg: 0 · Max: 0

P::3

Avg: 0 · Max: 0

P::4

Avg: 0 · Max: 0

undefined

Avg: 0 · Max: 0

Bugs created per month by Severity

S::1

Avg: 0 · Max: 0

S::2

Avg: 0 · Max: 0

S::3

Avg: 0 · Max: 0

S::4

Avg: 0 · Max: 0

undefined

Avg: 0 · Max: 0

- All
- Push events
- Merge events
- Issue events

- Comments
- Wiki
- Designs
- Team

8 minutes ago

Kananga5 @Kananga5
pushed to branch main

- 47248643 · Update .gitlab-ci.yml

10 minutes ago

Kananga5 @Kananga5
pushed new tag e
14 minutes ago

Kananga5 @Kananga5
opened test_case #3 "engineerinf"
17 minutes ago

Kananga5 @Kananga5
opened merge request !1 "Update .gitlab-ci.yml file,3"
20 minutes ago

Kananga5 @Kananga5
pushed new branch main2
23 minutes ago

Kananga5 @Kananga5
created wiki page homeengineering thesis
25 minutes ago

Kananga5 @Kananga5
opened issue #2 "doctoract thesis"
29 minutes ago

Kananga5 @Kananga5
pushed to branch main

- 0e6de252 · Edit README.mdeng

1 week ago

Kananga5 @Kananga5
opened milestone %thesis engineering
1 week ago

Kananga5 @Kananga5
opened issue #1 "thesisi engineering project"
1 week ago

Kananga5 @Kananga5
pushed new branch main
1 week ago

Kananga5 @Kananga5
pushed to branch main

- f20a39bf · Configure SAST in `.gitlab-ci.yml`, creating this file if it does n...

1 week ago

Kananga5 @Kananga5
created project engineering tshingombe / thesis hon

Status	Pipeline	Created by	Stages	Actions
Failed 9 minutes ago	Update .gitlab-ci.yml #1669384720 main 47248643 latest yaml invalid error			
Failed 19 minutes ago	Update .gitlab-ci.yml file,3 #1669365463 1 11ea2662 latest yaml invalid error merge request			
Failed 21 minutes ago	Update .gitlab-ci.yml file,3 #1669360850 main2 11ea2662 			

latest yaml invalid error

· All 1
· Active
· Inactive

Description (Click to sort ascending)	Interval	Target (Click to sort ascending)	Last Pipeline	Next Run (Click to sort ascending)	Owner
engineering	28 1 * * *	Pacific/Pago_Pago			

1. thesis-honor-degre-engineering-and-education-technologie
2.

1.

thesis-honor-degre-engineering-and-education-technologie

Update .gitlab-ci.yml file

Kananga5 authored 2 minutes ago

bb368b4c

Name	Last commit	Last update
.gitlab-ci.yml	Update .gitlab-ci.yml file	2 minutes ago
README.md	Initial commit	1 week ago

README.md

thesis honor degre engineering and education technologie

Getting started

To make it easy for you to get started with GitLab, here's a list of recommended next steps.

Already a pro? Just edit this README.md and make it your own. Want to make it easy? Use the template at the bottom!

Add your files

- [ ] Create or upload files
- [ ] Add files using the command line or push an existing Git repository with the following command:

```
cd existing_repo
git remote add origin https://gitlab.com/engineering-tshingombe/thesis-honor-degre-engineering-and-education-technologie.git
git branch -M main
git push -uf origin main
```

Integrate with your tools

- [ ] Set up project integrations

Collaborate with your team

- [ ] Invite team members and collaborators
- [ ] Create a new merge request
- [ ] Automatically close issues from merge requests
- [ ] Enable merge request approvals
- [ ] Set auto-merge

Test and Deploy

Use the built-in continuous integration in GitLab.

- [ ] Get started with GitLab CI/CD

- Analyze your code for known vulnerabilities with Static Application Security Testing (SAST)
- Deploy to Kubernetes, Amazon EC2, or Amazon ECS using Auto Deploy
- Use pull-based deployments for improved Kubernetes management
- Set up protected environments

Editing this README

When you're ready to make this README your own, just edit this file and use the handy template below (or feel free to structure it however you want - this is just a starting point!). Thanks to makeareadme.com for this template.

Suggestions for a good README

Every project is different, so consider which of these sections apply to yours. The sections used in the template are suggestions for most open source projects. Also keep in mind that while a README can be too long and detailed, too long is better than too short. If you think your README is too long, consider utilizing another form of documentation rather than cutting out information.

Name

Choose a self-explaining name for your project.

Description

Let people know what your project can do specifically. Provide context and add a link to any reference visitors might be unfamiliar with. A list of Features or a Background subsection can also be added here. If there are alternatives to your project, this is a good place to list differentiating factors.

Badges

On some READMEs, you may see small images that convey metadata, such as whether or not all the tests are passing for the project. You can use Shields to add some to your README. Many services also have instructions for adding a badge.

Visuals

Depending on what you are making, it can be a good idea to include screenshots or even a video (you'll frequently see GIFs rather than actual videos). Tools like ttygif can help, but check out Asciinema for a more sophisticated method.

Installation

Within a particular ecosystem, there may be a common way of installing things, such as using Yarn, NuGet, or Homebrew. However, consider the possibility that whoever is reading your README is a novice and would like more guidance. Listing specific steps helps remove ambiguity and gets people to using your project as quickly as possible. If it only runs in a specific context like a particular programming language version or operating system or has dependencies that have to be installed manually, also add a Requirements subsection.

Usage

Use examples liberally, and show the expected output if you can. It's helpful to have inline the smallest example of usage that you can demonstrate, while providing links to more sophisticated examples if they are too long to reasonably include in the README.

Support

Tell people where they can go to for help. It can be any combination of an issue tracker, a chat room, an email address, etc.

Roadmap

If you have ideas for releases in the future, it is a good idea to list them in the README.

Contributing

State if you are open to contributions and what your requirements are for accepting them.

For people who want to make changes to your project, it's helpful to have some documentation on how to get started. Perhaps there is a script that they should run or some environment variables that they need to set. Make these steps explicit. These instructions could also be useful to your future self.

You can also document commands to lint the code or run tests. These steps help to ensure high code quality and reduce the likelihood that the changes inadvertently break something. Having instructions for running tests is especially helpful if it requires external setup, such as starting a Selenium server for testing in a browser.

Authors and acknowledgment

Show your appreciation to those who have contributed to the project.

License

For open source projects, say how it is licensed.

Project status

If you have run out of energy or time for your project, put a note at the top of the README saying that development has slowed down or stopped completely. Someone may choose to fork your project or volunteer to step in as a maintainer or owner, allowing your project to keep going. You can also make an explicit request for m

- Kananga5
- Curriculum-section-1-1.1-Thesis.-Degree-honor-council-quality-rules-low-become-ju
-

· Code
·

· Issues 5

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· Pull requests

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· Discussions

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· Actions

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· Projects 1

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· Wiki

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· Security

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· Insights

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- Settings

Files

t

-

.github

-

workflows

-

· azure-webapps-node.yml
· · blank.yml
· · generator-generic-ossf-slsa3-publish.yml
· · ibm.yml
· · mdbook.yml

- · ·

  static.yml

  · · EXTENSION E-MAIL.pdf
  · · FUNDING.yml

  · · FormSubmission-request-ip-licencemip-67-25-0100-000.pdf

  · · Request for extension of visa template - Amended.docx

  · · SBIR-STTR Submitted Project Pitch.pdf

  · · Weekly Office Schedule.docx

  · · course ciriculum total course thesis alumine.docx

  · · e

  · · report1738657689944.xls

- · ·

  report1738657922688.xls

  · · .gitignore
  · · LICENSE

  - ·

    README.md

  1. Curriculum-section-1-1.1-Thesis.-Degree-honor-council-quality-rules-low-become-ju
  2. /.github

  /

workflows

/

Kananga5

Create mdbook.ymleng

0bebd64 · Feb 13, 2025

Name	Last commit message	Last commit date
..		
azure-webapps-node.yml	Create azure-webapps-node.yml.tshing	Jan 30, 2025
blank.yml	Create blank.yml. engin	Jan 30, 2025
generator-generic-ossf-slsa3-publish.yml	Create generator-generic-ossf-slsa3-publish.ymlen	Feb 4, 2025
ibm.yml	Create ibm.yml,tshing	Jan 30, 2025
mdbook.yml	Create mdbook.ymleng	Feb 13, 2025
static.yml	Create static.yml	

1 file changed

+78

-0

lines changed

Customizable line height

The default line height has been increased for improved accessibility. You can choose to enable a more compact line height from the view settings menu.

.github/workflows/azure-webapps-node.yml

+78

- ·

Original file line number	Diff line number	Diff line change

```
@@ -0,0 +1,78 @@


# This workflow will build and push a node.js application to an Azure Web App
when a commit is pushed to your default branch.


#


# This workflow assumes you have already created the target Azure App Service
web app.


# For instructions see
https://docs.microsoft.com/en-us/azure/app-service/quickstart-nodejs?
tabs=linux&pivots=development-environment-cli


#
```

```
# To configure this workflow:

#

# 1. Download the Publish Profile for your Azure Web App. You can download
this file from the Overview page of your Web App in the Azure Portal.

# For more information:
https://docs.microsoft.com/en-us/azure/app-service/deploy-github-actions?
tabs=applevel#generate-deployment-credentials

#

# 2. Create a secret in your repository named AZURE_WEBAPP_PUBLISH_PROFILE,
paste the publish profile contents as the value of the secret.

# For instructions on obtaining the publish profile see:
https://docs.microsoft.com/azure/app-service/deploy-github-actions#configure-
the-github-secret

#

# 3. Change the value for the AZURE_WEBAPP_NAME. Optionally, change the
AZURE_WEBAPP_PACKAGE_PATH and NODE_VERSION environment variables below.

#

# For more information on GitHub Actions for Azure:
https://github.com/Azure/Actions

# For more information on the Azure Web Apps Deploy action:
https://github.com/Azure/webapps-deploy
```

```
# For more samples to get started with GitHub Action workflows to deploy to
Azure: https://github.com/Azure/actions-workflow-samples



on:


push:


branches: [ "main" ]


workflow_dispatch:




env:


AZURE_WEBAPP_NAME: your-app-name # set this to your application's name


AZURE_WEBAPP_PACKAGE_PATH: '.' # set this to the path to your web app
project, defaults to the repository root


NODE_VERSION: '20.x' # set this to the node version to use




permissions:


contents: read
```

```
jobs:

build:

runs-on: ubuntu-latest

steps:

- uses: actions/checkout@v4



- name: Set up Node.js

uses: actions/setup-node@v4

with:

node-version: ${{ env.NODE_VERSION }}

cache: 'npm'



- name: npm install, build, and test

run: |

npm install
```

```
npm run build --if-present

npm run test --if-present



- name: Upload artifact for deployment job

uses: actions/upload-artifact@v4

with:

name: node-app

path: .



deploy:

permissions:

contents: none

runs-on: ubuntu-latest

needs: build

environment:
```

```
name: 'Development'

url: ${{ steps.deploy-to-webapp.outputs.webapp-url }}



steps:

- name: Download artifact from build job

uses: actions/download-artifact@v4

with:

name: node-app



- name: 'Deploy to Azure WebApp'

id: deploy-to-webapp

uses: azure/webapps-deploy@v2

with:

app-name: ${{ env.AZURE_WEBAPP_NAME }}

publish-profile: ${{ secrets.AZURE_WEBAPP_PUBLISH_PROFILE }}
```

```
package: ${{ env.AZURE_WEBAPP_PACKAGE_PATH }}
```

```
# This is a basic workflow to help you get started with Actions


name: CI


# Controls when the workflow will run

on:

  # Triggers the workflow on push or pull request events but only for the "main" branch

  push:

    branches: [ "main" ]

  pull_request:

    branches: [ "main" ]


  # Allows you to run this workflow manually from the Actions tab

  workflow_dispatch:


# A workflow run is made up of one or more jobs that can run sequentially or in parallel

jobs:

  # This workflow contains a single job called "build"

  build:

    # The type of runner that the job will run on

    runs-on: ubuntu-latest


    # Steps represent a sequence of tasks that will be executed as part of the job

    steps:
```

```
    # Checks-out your repository under $GITHUB_WORKSPACE, so your job can access it
    - uses: actions/checkout@v4

    # Runs a single command using the runners shell
    - name: Run a one-line script
      run: echo Hello, world!

    # Runs a set of commands using the runners shell
    - name: Run a multi-line script
      run: |
        echo Add other actions to build,
        echo test, and deploy your project.
# This workflow uses actions that are not certified by GitHub.
# They are provided by a third-party and are governed by
# separate terms of service, privacy policy, and support
# documentation.

# This workflow lets you generate SLSA provenance file for your project.
# The generation satisfies level 3 for the provenance requirements - see https://slsa.dev/spec/v0.1/requirements
# The project is an initiative of the OpenSSF (openssf.org) and is developed at
# https://github.com/slsa-framework/slsa-github-generator.
# The provenance file can be verified using https://github.com/slsa-framework/slsa-verifier.
# For more information about SLSA and how it improves the supply-chain, visit slsa.dev.

name: SLSA generic generator
```

```
on:
  workflow_dispatch:
  release:
    types: [created]

jobs:
  build:
    runs-on: ubuntu-latest
    outputs:
      digests: ${{ steps.hash.outputs.digests }}

    steps:
      - uses: actions/checkout@v4

      #
============================================================
==========
      #
      # Step 1: Build your artifacts.
      #
      #
============================================================
==========
      - name: Build artifacts
        run: |
            # These are some amazing artifacts.
            echo "artifact1" > artifact1
            echo "artifact2" > artifact2
```

```
    #
==========================================================
==========
    #
    # Step 2: Add a step to generate the provenance subjects
    #         as shown below. Update the sha256 sum arguments
    #         to include all binaries that you generate
    #         provenance for.
    #
    #
==========================================================
==========
    - name: Generate subject for provenance
      id: hash
      run: |
        set -euo pipefail


        # List the artifacts the provenance will refer to.
        files=$(ls artifact*)
        # Generate the subjects (base64 encoded).
        echo "hashes=$(sha256sum $files | base64 -w0)" >> "$
{GITHUB_OUTPUT}"


  provenance:
    needs: [build]
    permissions:
      actions: read   # To read the workflow path.
      id-token: write # To sign the provenance.
      contents: write # To add assets to a release.
```

```
    uses: slsa-framework/slsa-github-generator/.github/workflows/generator_generic_slsa3.yml@v1.4.0
    with:
      base64-subjects: "${{ needs.build.outputs.digests }}"
      upload-assets: true # Optional: Upload to a new release
# Sample workflow for building and deploying a mdBook site to GitHub Pages
#
# To get started with mdBook see: https://rust-lang.github.io/mdBook/index.html
#
name: Deploy mdBook site to Pages


on:
  # Runs on pushes targeting the default branch
  push:
    branches: ["main"]


  # Allows you to run this workflow manually from the Actions tab
  workflow_dispatch:


# Sets permissions of the GITHUB_TOKEN to allow deployment to GitHub Pages
permissions:
  contents: read
  pages: write
  id-token: write


# Allow only one concurrent deployment, skipping runs queued between the run in-progress and latest queued.
```

```
# However, do NOT cancel in-progress runs as we want to allow these production deployments to complete.
concurrency:
  group: "pages"
  cancel-in-progress: false

jobs:
  # Build job
  build:
    runs-on: ubuntu-latest
    env:
      MDBOOK_VERSION: 0.4.36
    steps:
      - uses: actions/checkout@v4
      - name: Install mdBook
        run: |
          curl --proto '=https' --tlsv1.2 https://sh.rustup.rs -sSf -y | sh
          rustup update
          cargo install --version ${MDBOOK_VERSION} mdbook
      - name: Setup Pages
        id: pages
        uses: actions/configure-pages@v5
      - name: Build with mdBook
        run: mdbook build
      - name: Upload artifact
        uses: actions/upload-pages-artifact@v3
        with:
          path: ./book
```

```
  # Deployment job
  deploy:
    environment:
      name: github-pages
      url: ${{ steps.deployment.outputs.page_url }}
    runs-on: ubuntu-latest
    needs: build
    steps:
      - name: Deploy to GitHub Pages
        id: deployment
        uses: actions/deploy-pages@v4
```

@Kananga5's untitled project

Backlog

Team capacity

Current iteration

Roadmap

My items

View 6

thesis

0 (0) matching items

Todo

0 / 5 (0 / 5)

Estimate: 0

This item hasn't been started

In Progress

0 / 5 (0 / 5)

Estimate: 0

This is actively being worked on

Done

0 (0)

Estimate: 0

This has been completed

Value Streams Dashboard

Track key DevSecOps metrics throughout the development lifecycle. Learn more.

Background aggregation not enabled

To see usage overview, you must enable background aggregation.

Usage overview for the thesis honor degre engineering and education technologie project

E

Project

engineering tshingombe / thesis honor degre engineering and education technologie

Issues

-

Merge requests

-

Pipelines

-

Lifecycle metrics for the thesis honor degre engineering and education technologie project

Metric	December Dec 1 - Dec 31	January Jan 1 - Jan 31	Month to date Feb 1 - Feb 13	Past 6 Months Aug 13 - Feb 13
Lead time	-	-	-	
Cycle time	-	-	-	
Issues created	-	-	1	
Issues closed	-	-	-	
Deploys	-	-	-	
Merge request throughput		-	-	-
Median time to merge		-	-	-

DORA metrics for the thesis honor degre engineering and education technologie project

Metric	December Dec 1 - Dec 31	January Jan 1 - Jan 31	Month to date Feb 1 - Feb 13	Past 6 Months Aug 13 - Feb 13
Deployment frequency	0.0/d	0.0/d	0.0/d	
Lead time for changes	0.0 d	0.0 d	0.0 d	
Time to restore service	0.0 d	0.0 d	0.0 d	
Change failure rate	0.0 %	0.0 %	0.0 %	

Security metrics for the thesis honor degre engineering and education technologie project

Metric	December Dec 1 - Dec 31	January Jan 1 - Jan 31	Month to date Feb 1 - Feb 13	Past 6 Months Aug 13 - Feb 13
Critical vulnerabilities over time	-	-	-	
High vulnerabilities over time	-	-		

1. engineering tshingombe
2. thesis honor degre engineering and education technologie
3. Issue Analytics

Issue Analytics

□□□□

□□□□

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-

□□□□

Overview

Opened

Avg: 76.9m · Max: 1

Closed

Avg: 0 · Max: 0

Issue	Age	Status	Milestone	Iteration	Weight	Due date	Assignees	Created by
thesisi engineering project • #1	9 days	Opened						

1. engineering tshingombe
2. thesis honor degre engineering and education technologie
3. Insights

Insights

Configure a custom report for insights into your group processes such as amount of issues, bugs, and merge requests per month. How do I configure an insights report?

Issues Dashboard

Issues created per month

Issues closed per month

Bugs created per month by Priority

December 2024

undefined

0

P::4

0

P::3

0

P::2

0

P::1

0

P::1

Avg: 0 · Max: 0

P::2

Avg: 0 · Max: 0

P::3

Avg: 0 · Max: 0

P::4

Avg: 0 · Max: 0

undefined

Avg: 0 · Max: 0

Bugs created per month by Severity

S::1

Avg: 0 · Max: 0

S::2

Avg: 0 · Max: 0

S::3

Avg: 0 · Max: 0

S::4

Avg: 0 · Max: 0

undefined

Avg: 0 · Max: 0

- All
- Push events
- Merge events
- Issue events

- Comments
- Wiki
- Designs
- Team

8 minutes ago

Kananga5 @Kananga5
pushed to branch main

- 47248643 · Update .gitlab-ci.yml

10 minutes ago

Kananga5 @Kananga5
pushed new tag e
14 minutes ago

Kananga5 @Kananga5
opened test_case #3 "engineerinf"
17 minutes ago

Kananga5 @Kananga5
opened merge request !1 "Update .gitlab-ci.yml file,3"
20 minutes ago

Kananga5 @Kananga5
pushed new branch main2
23 minutes ago

Kananga5 @Kananga5
created wiki page homeengineering thesis
25 minutes ago

Kananga5 @Kananga5
opened issue #2 "doctoract thesis"
29 minutes ago

Kananga5 @Kananga5
pushed to branch main

- 0e6de252 · Edit README.mdeng

1 week ago

Kananga5 @Kananga5
opened milestone %thesis engineering
1 week ago

Kananga5 @Kananga5
opened issue #1 "thesisi engineering project"
1 week ago

Kananga5 @Kananga5
pushed new branch main
1 week ago

Kananga5 @Kananga5
pushed to branch main

- f20a39bf · Configure SAST in `.gitlab-ci.yml`, creating this file if it does n...

1 week ago

Kananga5 @Kananga5
created project engineering tshingombe / thesis hon

Status	Pipeline	Created by	Stages	Actions
Failed 9 minutes ago	Update .gitlab-ci.yml #1669384720 main 47248643 latest yaml invalid error			
Failed 19 minutes ago	Update .gitlab-ci.yml file,3 #1669365463 1 11ea2662 latest yaml invalid error merge request			
Failed 21 minutes ago	Update .gitlab-ci.yml file,3 #1669360850 main2 11ea2662 			

latest yaml invalid error

· All 1
· Active
· Inactive

Description (Click to sort ascending)	Interval	Target (Click to sort ascending)	Last Pipeline	Next Run (Click to sort ascending)	Owner
engineering	28 1 * * *	Pacific/Pago_Pago			

1. thesis-honor-degre-engineering-and-education-technologie
2.

1.

thesis-honor-degre-engineering-and-education-technologie

Update .gitlab-ci.yml file

Kananga5 authored 2 minutes ago

bb368b4c

Name	Last commit	Last update
.gitlab-ci.yml	Update .gitlab-ci.yml file	2 minutes ago
README.md	Initial commit	1 week ago

README.md

thesis honor degre engineering and education technologie

Getting started

To make it easy for you to get started with GitLab, here's a list of recommended next steps.

Already a pro? Just edit this README.md and make it your own. Want to make it easy? Use the template at the bottom!

Add your files

- [ ] Create or upload files
- [ ] Add files using the command line or push an existing Git repository with the following command:

```
cd existing_repo
git remote add origin https://gitlab.com/engineering-tshingombe/thesis-honor-degre-engineering-and-education-technologie.git
git branch -M main
git push -uf origin main
```

Integrate with your tools

- [ ] Set up project integrations

Collaborate with your team

- [ ] Invite team members and collaborators
- [ ] Create a new merge request
- [ ] Automatically close issues from merge requests
- [ ] Enable merge request approvals
- [ ] Set auto-merge

Test and Deploy

Use the built-in continuous integration in GitLab.

- [ ] Get started with GitLab CI/CD

- Analyze your code for known vulnerabilities with Static Application Security Testing (SAST)
- Deploy to Kubernetes, Amazon EC2, or Amazon ECS using Auto Deploy
- Use pull-based deployments for improved Kubernetes management
- Set up protected environments

Editing this README

When you're ready to make this README your own, just edit this file and use the handy template below (or feel free to structure it however you want - this is just a starting point!). Thanks to makeareadme.com for this template.

Suggestions for a good README

Every project is different, so consider which of these sections apply to yours. The sections used in the template are suggestions for most open source projects. Also keep in mind that while a README can be too long and detailed, too long is better than too short. If you think your README is too long, consider utilizing another form of documentation rather than cutting out information.

Name

Choose a self-explaining name for your project.

Description

Let people know what your project can do specifically. Provide context and add a link to any reference visitors might be unfamiliar with. A list of Features or a Background subsection can also be added here. If there are alternatives to your project, this is a good place to list differentiating factors.

Badges

On some READMEs, you may see small images that convey metadata, such as whether or not all the tests are passing for the project. You can use Shields to add some to your README. Many services also have instructions for adding a badge.

Visuals

Depending on what you are making, it can be a good idea to include screenshots or even a video (you'll frequently see GIFs rather than actual videos). Tools like ttygif can help, but check out Asciinema for a more sophisticated method.

Installation

Within a particular ecosystem, there may be a common way of installing things, such as using Yarn, NuGet, or Homebrew. However, consider the possibility that whoever is reading your README is a novice and would like more guidance. Listing specific steps helps remove ambiguity and gets people to using your project as quickly as possible. If it only runs in a specific context like a particular programming language version or operating system or has dependencies that have to be installed manually, also add a Requirements subsection.

Usage

Use examples liberally, and show the expected output if you can. It's helpful to have inline the smallest example of usage that you can demonstrate, while providing links to more sophisticated examples if they are too long to reasonably include in the README.

Support

Tell people where they can go to for help. It can be any combination of an issue tracker, a chat room, an email address, etc.

Roadmap

If you have ideas for releases in the future, it is a good idea to list them in the README.

Contributing

State if you are open to contributions and what your requirements are for accepting them.

For people who want to make changes to your project, it's helpful to have some documentation on how to get started. Perhaps there is a script that they should run or some environment variables that they need to set. Make these steps explicit. These instructions could also be useful to your future self.

You can also document commands to lint the code or run tests. These steps help to ensure high code quality and reduce the likelihood that the changes inadvertently break something. Having instructions for running tests is especially helpful if it requires external setup, such as starting a Selenium server for testing in a browser.

Authors and acknowledgment

Show your appreciation to those who have contributed to the project.

License

For open source projects, say how it is licensed.

Project status

If you have run out of energy or time for your project, put a note at the top of the README saying that development has slowed down or stopped completely. Someone may choose to fork your project or volunteer to step in as a maintainer or owner, allowing your project to keep going. You can also make an explicit request for m

- Kananga5
- Curriculum-section-1-1.1-Thesis.-Degree-honor-council-quality-rules-low-become-ju
-

· Code
·

· Issues 5

·

· Pull requests

·

· Discussions

·

· Actions

·

· Projects 1

·

· Wiki

·

· Security

·

· Insights

·

- Settings

Files

t

-

.github

-

workflows

-

· azure-webapps-node.yml
· · blank.yml
· · generator-generic-ossf-slsa3-publish.yml
· · ibm.yml
· · mdbook.yml

- · ·

  static.yml

  · · EXTENSION E-MAIL.pdf
  · · FUNDING.yml

  · · FormSubmission-request-ip-licencemip-67-25-0100-000.pdf

  · · Request for extension of visa template - Amended.docx

  · · SBIR-STTR Submitted Project Pitch.pdf

  · · Weekly Office Schedule.docx

  · · course ciriculum total course thesis alumine.docx

  · · e

  · · report1738657689944.xls

- · ·

  report1738657922688.xls

  · · .gitignore
  · · LICENSE

  - ·

    README.md

  1. Curriculum-section-1-1.1-Thesis.-Degree-honor-council-quality-rules-low-become-ju
  2. /.github

  /

workflows

/

Kananga5

Create mdbook.ymleng

0bebd64 · Feb 13, 2025

Name	Last commit message	Last commit date
..		
azure-webapps-node.yml	Create azure-webapps-node.yml.tshing	Jan 30, 2025
blank.yml	Create blank.yml. engin	Jan 30, 2025
generator-generic-ossf-slsa3-publish.yml	Create generator-generic-ossf-slsa3-publish.ymlen	Feb 4, 2025
ibm.yml	Create ibm.yml,tshing	Jan 30, 2025
mdbook.yml	Create mdbook.ymleng	Feb 13, 2025
static.yml	Create static.yml	

1 file changed

+78

-0

lines changed

Customizable line height

The default line height has been increased for improved accessibility. You can choose to enable a more compact line height from the view settings menu.

.github/workflows/azure-webapps-node.yml

+78

- **Original file line number** **Diff line number** **Diff line change**

```
@@ -0,0 +1,78 @@

# This workflow will build and push a node.js application to an Azure Web App
when a commit is pushed to your default branch.

#

# This workflow assumes you have already created the target Azure App Service
web app.

# For instructions see
https://docs.microsoft.com/en-us/azure/app-service/quickstart-nodejs?
tabs=linux&pivots=development-environment-cli

#
```

```
# To configure this workflow:

#

# 1. Download the Publish Profile for your Azure Web App. You can download
this file from the Overview page of your Web App in the Azure Portal.

# For more information:
https://docs.microsoft.com/en-us/azure/app-service/deploy-github-actions?
tabs=applevel#generate-deployment-credentials

#

# 2. Create a secret in your repository named AZURE_WEBAPP_PUBLISH_PROFILE,
paste the publish profile contents as the value of the secret.

# For instructions on obtaining the publish profile see:
https://docs.microsoft.com/azure/app-service/deploy-github-actions#configure-
the-github-secret

#

# 3. Change the value for the AZURE_WEBAPP_NAME. Optionally, change the
AZURE_WEBAPP_PACKAGE_PATH and NODE_VERSION environment variables below.

#

# For more information on GitHub Actions for Azure:
https://github.com/Azure/Actions

# For more information on the Azure Web Apps Deploy action:
https://github.com/Azure/webapps-deploy
```

```
# For more samples to get started with GitHub Action workflows to deploy to
Azure: https://github.com/Azure/actions-workflow-samples



on:


push:


branches: [ "main" ]


workflow_dispatch:




env:


AZURE_WEBAPP_NAME: your-app-name # set this to your application's name


AZURE_WEBAPP_PACKAGE_PATH: '.' # set this to the path to your web app
project, defaults to the repository root


NODE_VERSION: '20.x' # set this to the node version to use




permissions:


contents: read
```

```
jobs:

build:

runs-on: ubuntu-latest

steps:

- uses: actions/checkout@v4



- name: Set up Node.js

uses: actions/setup-node@v4

with:

node-version: ${{ env.NODE_VERSION }}

cache: 'npm'



- name: npm install, build, and test

run: |

npm install
```

```
npm run build --if-present

npm run test --if-present



- name: Upload artifact for deployment job

uses: actions/upload-artifact@v4

with:

name: node-app

path: .



deploy:

permissions:

contents: none

runs-on: ubuntu-latest

needs: build

environment:
```

```
name: 'Development'

url: ${{ steps.deploy-to-webapp.outputs.webapp-url }}



steps:

- name: Download artifact from build job

uses: actions/download-artifact@v4

with:

name: node-app



- name: 'Deploy to Azure WebApp'

id: deploy-to-webapp

uses: azure/webapps-deploy@v2

with:

app-name: ${{ env.AZURE_WEBAPP_NAME }}

publish-profile: ${{ secrets.AZURE_WEBAPP_PUBLISH_PROFILE }}
```

```
package: ${{ env.AZURE_WEBAPP_PACKAGE_PATH }}
```

```
# This is a basic workflow to help you get started with Actions


name: CI


# Controls when the workflow will run

on:

  # Triggers the workflow on push or pull request events but only for the "main" branch

  push:

    branches: [ "main" ]

  pull_request:

    branches: [ "main" ]


  # Allows you to run this workflow manually from the Actions tab

  workflow_dispatch:


# A workflow run is made up of one or more jobs that can run sequentially or in parallel

jobs:

  # This workflow contains a single job called "build"

  build:

    # The type of runner that the job will run on

    runs-on: ubuntu-latest


    # Steps represent a sequence of tasks that will be executed as part of the job

    steps:
```

```
    # Checks-out your repository under $GITHUB_WORKSPACE, so your job can access it
    - uses: actions/checkout@v4

    # Runs a single command using the runners shell
    - name: Run a one-line script
      run: echo Hello, world!

    # Runs a set of commands using the runners shell
    - name: Run a multi-line script
      run: |
        echo Add other actions to build,
        echo test, and deploy your project.
# This workflow uses actions that are not certified by GitHub.
# They are provided by a third-party and are governed by
# separate terms of service, privacy policy, and support
# documentation.

# This workflow lets you generate SLSA provenance file for your project.
# The generation satisfies level 3 for the provenance requirements - see https://slsa.dev/spec/v0.1/requirements
# The project is an initiative of the OpenSSF (openssf.org) and is developed at
# https://github.com/slsa-framework/slsa-github-generator.
# The provenance file can be verified using https://github.com/slsa-framework/slsa-verifier.
# For more information about SLSA and how it improves the supply-chain, visit slsa.dev.

name: SLSA generic generator
```

```
on:
  workflow_dispatch:
  release:
    types: [created]

jobs:
  build:
    runs-on: ubuntu-latest
    outputs:
      digests: ${{ steps.hash.outputs.digests }}

    steps:
      - uses: actions/checkout@v4

      #
============================================================
==========
      #
      # Step 1: Build your artifacts.
      #
      #
============================================================
==========
      - name: Build artifacts
        run: |
            # These are some amazing artifacts.
            echo "artifact1" > artifact1
            echo "artifact2" > artifact2
```

```
    #
================================================================
    #
    # Step 2: Add a step to generate the provenance subjects
    #         as shown below. Update the sha256 sum arguments
    #         to include all binaries that you generate
    #         provenance for.
    #
    #
================================================================
    - name: Generate subject for provenance
      id: hash
      run: |
        set -euo pipefail


        # List the artifacts the provenance will refer to.
        files=$(ls artifact*)
        # Generate the subjects (base64 encoded).
        echo "hashes=$(sha256sum $files | base64 -w0)" >> "$
{GITHUB_OUTPUT}"


  provenance:
    needs: [build]
    permissions:
      actions: read   # To read the workflow path.
      id-token: write # To sign the provenance.
      contents: write # To add assets to a release.
```

```
    uses:
slsa-framework/slsa-github-generator/.github/workflows/generator_generic_sl
sa3.yml@v1.4.0
    with:
      base64-subjects: "${{ needs.build.outputs.digests }}"
      upload-assets: true # Optional: Upload to a new release
# Sample workflow for building and deploying a mdBook site to GitHub
Pages
#
# To get started with mdBook see:
https://rust-lang.github.io/mdBook/index.html
#
name: Deploy mdBook site to Pages


on:
  # Runs on pushes targeting the default branch
  push:
    branches: ["main"]


  # Allows you to run this workflow manually from the Actions tab
  workflow_dispatch:


# Sets permissions of the GITHUB_TOKEN to allow deployment to GitHub
Pages
permissions:
  contents: read
  pages: write
  id-token: write


# Allow only one concurrent deployment, skipping runs queued between the
run in-progress and latest queued.
```

```
# However, do NOT cancel in-progress runs as we want to allow these production deployments to complete.
concurrency:
  group: "pages"
  cancel-in-progress: false

jobs:
  # Build job
  build:
    runs-on: ubuntu-latest
    env:
      MDBOOK_VERSION: 0.4.36
    steps:
      - uses: actions/checkout@v4
      - name: Install mdBook
        run: |
          curl --proto '=https' --tlsv1.2 https://sh.rustup.rs -sSf -y | sh
          rustup update
          cargo install --version ${MDBOOK_VERSION} mdbook
      - name: Setup Pages
        id: pages
        uses: actions/configure-pages@v5
      - name: Build with mdBook
        run: mdbook build
      - name: Upload artifact
        uses: actions/upload-pages-artifact@v3
        with:
          path: ./book
```

```
  # Deployment job
  deploy:
    environment:
      name: github-pages
      url: ${{ steps.deployment.outputs.page_url }}
    runs-on: ubuntu-latest
    needs: build
    steps:
      - name: Deploy to GitHub Pages
        id: deployment
        uses: actions/deploy-pages@v4
```

@Kananga5's untitled project

Backlog

Team capacity

Current iteration

Roadmap

My items

View 6

thesis

0 (0) matching items

Todo

0 / 5 (0 / 5)

Estimate: 0

This item hasn't been started

In Progress

0 / 5 (0 / 5)

Estimate: 0

This is actively being worked on

Done

0 (0)

Estimate: 0

This has been completed